

A TABLE shewing a regular Succession of Crops in Rotation, and the Expence and Profit attending 150 Acres at one View, see both what his Farm ought to be stocked with, what he ought to make Money of, and what

In what Year each Field was cropped with.	Suppose the six Columns six Fields, twenty Acres in each, shews six Sorts of Crops, to follow each other in Rotation, four of which are charged to this Account, but the two Clover-Crops go to maintain the Cattle, and are charged to them.						Natural Grafs to accommodate this Farm.	Meadow to accommodate this Farm.	four 3 Years old Horses fold every Year at 10l. each.	Six 3 Years old Bullocks fold every Year at 6l. each.	15 fat Hogs fold each Year at 2l. each.	80 Quar. of Wheat fold each Year at 2l. per Quarter
	A 20 Acres	B 20 Acres	C 20 Acres	D 20 Acres	E 20 Acres	F 20 Acres						
The Year of our Lord	1796	1797	1798	1799	1800	1801	G 20 Acres	H 10 Acres	Horses	Bullocks	Hogs	Wheat
	Wheat	Oats	Turnips	Barley	Clover Grafs	Clover Hay	Grafs	Meadow	1. 40	1. 30	1. 30	1. 160
	Oats	Turnips	Barley	Clover Grafs	Clover Hay	Wheat	Grafs	Meadow	40	30	30	160
	Turnips	Barley	Clover Grafs	Clover Hay	Wheat	Oats	Grafs	Meadow	40	30	30	160
	Barley	Clover Grafs	Clover Hay	Wheat	Oats	Turnips	Grafs	Meadow	40	30	30	160
	Clover Grafs	Clover Hay	Wheat	Oats	Turnips	Barley	Grafs	Meadow	40	30	30	160
	Clover Hay	Wheat	Oats	Turnips	Barley	Clover Grafs	Grafs	Meadow	40	30	30	160
	1. 568	1. 568	1. 568	1. 568	1. 568	1. 568	This Field is charged to the Account of the Cattle fold	This Field charged to the Account of Cattle fold, &c.	Total Produce of Horses fold in six Years	Total Produce of Cattle fold in six Years	Total Produce of Hogs fold in six Years	Total Cathby* Wheat in six Years

EXPLANATION of

The Columns wherein stand A, B, C, D, E, F, G, H, are supposed to be eight Fields, six of which are always kept in a regular Succession of Acres, near twenty may be rocky or woody, and not improveable or proper for Tillage, but may do well for Pasture. The parallel Line and from the Produce, we find clear Profit each Year 402l. 4s. as appears in the Cash Columns, which makes in six Years (the Time the Crops are desired, was he to pay five Thousand a Year Rent. In the Wheat Field he might introduce a few Acres of Flax; also in the Oat Field some hope this appears so plain, that it will introduce this profitable and useful Branch, on which the comfortable Necessaries of Life for both Man and Cattle are so easily obtained. It is fible for an Acre of Land to produce five Quarters of Wheat, twenty or twenty-five Sacks of Oats or Barley? He would immediately answer, no more Land than he can manage effectually, he may always depend upon the Success he proposes. Note, As we expect this Farm to be managed and Servants is full sufficient; also considering what Keeping is allowed, and the Price the Cattle cost when bought in, there is no doubt but that

TABLE II.

The Capital Stock, or Total Expence to stock a Farm of 150 Acres, with the Expence of the first Cost of 300 Sheep to feed with Turnips.

	6 Cows in Calf, at 6l. each	6 one Year old Calves, at 2l. each	6 two Year old Bullocks, at 3l. each	6 three Year old Bullocks, at 5l. each	8 Mares, at 10l. each	4 half Year old Foals, at 4l. each	4 two Year old Colts, at 6l. each	4 three Year old Colts, at 8l. each	2 Sows with 8 Pigs each, at 3l. each Sow	10 Hogs at half a Year old, at 10s.	2 Carts, at 8l. each, 1 Waggon 12l.	4 Plows, at 2l. each	4 Pair of Harrows, at 1l. each	8 Sets of Geers, at 15s.	300 Sheep to feed on Turnips, at 12s. per Sheep	20 Sheep for Family Use, at 10s. each	Total Expence, or first Capital	Number of Cattle that live on Grafs	Total Number of Sum or Foot that live on Grafs	
O	1. 36	1. 12	1. 18	1. 30	1. 80	1. 16	1. 24	1. 32	1. 6	1. 5	1. 28	1. 8	1. 4	1. 6	1. 108	1. 10	1. 494			R
P	6	6	6	6	8	4	4	4	0	0	0	0	0	0	0	20	0	64		H
Q	6	2	4	6	8	1½	2½	4	0	0	0	0	0	0	0	4	0	0	38	M

EXPLANATION.

In the parallel Lines between O and R, and in each Column, you see the Total Expence of each different Stock, &c. which is toted up and placed near R. In the next parallel Line between H and P, and in each Column, you see the Number of each different Stock, which all being added up, make 64, which is placed near H. In the parallel Line between Q and M, and in each Column, you see how many Foot of Cattle; and near M, is placed 38.

N. B. Three one Year old Calves or Foals make one Foot or Boll, or in Point of Joist, is equal to one full grown Beast of three years old; also one Year old and one two Years old, are counted in Joist a full grown Beast, and pays accordingly, but are a hard Stock. Beasts and Horses are not full grown till they are three Years old.

TABLE I.

ing 150 Acres Farm English Measure; or so in Proportion for any other Quantity of Land) so that a Farmer may and what Expence he is at, and Profit he gains, from one Year to six, beginning, we suppose, in the Year 1796.

each.	80 Quar. of Wheat fold each Year at 2l. per Quarter	120 Quar. of Barley fold each Year at 20s. per Quarter.	120 Quar. of Oats fold each Year at 18s. per Quarter	300 Sheep fed and fold each Year at 12s. Profit each.	Each Year's Produce.	One Head-man at 10l. two at 6l. and 2 Boys at 3l. each	One Head-maid at 4l. one at 3l. and a Girl at 2l.	Two Labourers at 8d. per Day each.	150 Acres at 15s. per Acre.	Yearly Repairs of Implements, &c.	Three Cows to feed for Family at 3l. each	20 Sheep for Family Use, at 10s. each, 4 fat Hogs, at 2l. each	To Seed and Bread Corn each Year	Yearly Expence.	Clear Profit Yearly.
Wheat	Barley	Oats	Sheep	£.	Men Servants	Women Servants	Labourers	Acres	Repairs	Dry Cows	Hogs and Sheep	Seed Corn, &c.	£. s.	£. s.	
1. 160	1. 120	1. 108	1. 180	1. 668	1. 28	1. 9	20l. 16s.	112l. 10s.	1. 10	1. 9	1. 18	58l. 10s.	265 16	402 4	
160	120	108	180	668	28	9	20 16	112 10	10	9	18	58 10	265 16	402 4	
160	120	108	180	668	28	9	20 16	112 10	10	9	18	58 10	265 16	402 4	
160	120	108	180	668	28	9	20 16	112 10	10	9	18	58 10	265 16	402 4	
160	120	108	180	668	28	9	20 16	112 10	10	9	18	58 10	265 16	402 4	
160	120	108	180	668	28	9	20 16	112 10	10	9	18	58 10	265 16	402 4	
160	120	108	180	668	28	9	20 16	112 10	10	9	18	58 10	265 16	402 4	
1. 960	1. 720	1. 648	1. 1080	1. 4008	1. 168	1. 54	124l. 16s.	1. 675	1. 60	1. 54	1. 108	35l.	1595 16	2413 4	
Total Cash by Wheat in six Years	Total Cash by Barley in six Years	Total Cash by Oats in six Years	Cash by Sheep fed with Turnips in 6 Years	Total Cash in six Years of a 150 Acres Farm	Total Expence in six Years for Men Servants.	Total Expence in six Years for Maid Servants	Total Expence in six Years for Labourers	Total Rent for six Years	Total Expence in six Years Repairs	Total for fat Cows in six Years	For Sheep and Hogs in six Years	Seed and Bread Corn for six Years	Total Expence for six Years	Clear Profit in six Years	

ON of the above TABLE.

ular Succession of Clover and Tillage; the other two, G, and H, are natural Meadow and Pasture, as it is an equal Chance, but out of every 150 Acre Line and in each Column as explained, you see the yearly Expence and Produce of each different Article, and upon subtracting the Expence (the Crops are going round) 2413l. 4s. clear Profit; neither can a Farmer say but he is allowed as good Living as any Grazier in England could have. Field some Pease or Beans, which might not at all lessen his Profit, but augment it, particularly if the Land was suitable for these Crops. We or both Man and Beast depend; and what is set forth is no way out of the common Course of Things; for were we to ask a Farmer, Was it possible to answer, Yes, a great deal more. Then what has been, may be again, for the same Cause will produce the same Effect; and when a Farmer has to be managed in the best Method of mowing the Corn, and plowing with one Man and two Horses, &c. &c. the above Allowance of Labourers is no doubt but they will give what we have charged them in felling out.

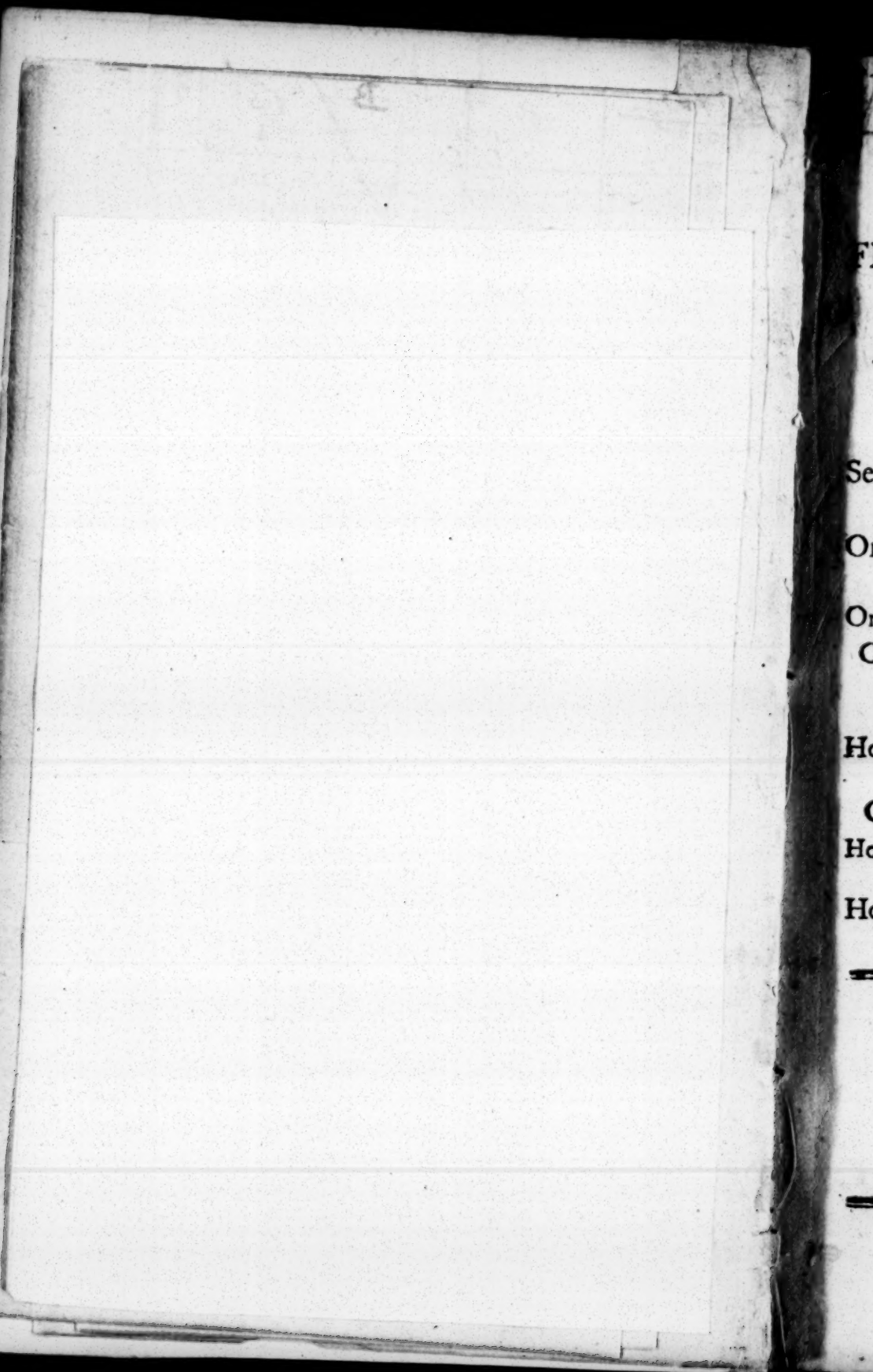
TABLE III.

Different Quantities of Grain or Seed sown on an Acre, as expressed in each Column, for Drill and Broad-cast Husbandry.

Different Sorts of Seed.	The Author's Quantity	The Irish Farmer's Quantity	English Farmer's Quantity	Drill Husbandry
Flax	8	10	8	0
Hemp	8	11	8	0
Wheat	5	11	8	0
Barley	6	12	12	0
Rye	6	10	8	0
Oats	8	14	12	0
Beans	8	14	8	4
Pease	14	14	8	2
Rape and Cole Seed	1	1½	1	1
Vetches	8	12	8	0
Saintfoin	16	16	16	1
Rye-grass	18	20	16	0
Buck-wheat	8	12	8	0
Potatoes	21	80	21	32
Clover	10	15	12	0
Lucerne	6	10	8	1½
Burnet	12	12	12	3
Turnips	1	2	1½	30z

It is our opinion, that though we sow thinner than most English Farmers, yet we throw one Half of our Seed away; particularly Wheat, Barley, Oats, Beans, Pease, and Rape. Indeed, we have not ventured to sow any large Quantity of Land with less than is set down, except in the new Method by dibbling. Note, Opposite each Crop that is not proper to be sown in Drill Husbandry, is left a Blank.

These Tables were laid in 1772, since which, both Labour and Rent of Land much the same, consequently the Profits arising in six Years must be rather more than less.



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THE
Guide of Reason, or
FLOATING IDEAS OF NATURE,

SUITED TO THE

Philosopher, Farmer, & Mechanic,

A MISCELLANY,

Containing 65 different Subjects, viz.

Several new Crops and their Management.

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On SIBERIAN WHEAT, and its Management.

On DIBBLING WHEAT, as practised in Norfolk, which clears 2l. 10s. per Acre above the common Method.

How to stock and manage 150 Acres Farm, so as to clear 400l. a Year.

On a general ACT to inclose COMMONS, &c.

How to improve them by Crops that will pay the Expence.

How to manage Horses in Stables without Litter, as practised in America.

By C. VARLO, Esq.

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IN TWO VOLUMES, PRICE 13s.

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VOL. I.

LONDON:

Printed for the Author, 1798.

No. of Counties in England.	Acres.	Houses.	Parishes	Market Towns.	Hun- dreds.
Bedfordshire	260000	12170	116	9	9
Berkshire	527000	17000	140	11	20
Buckinghamshire	441000	18390	185	15	8
Cumberland	1040000	14820	58	14	5
Cambridgeshire	570000	17350	163	7	17
Cheshire	720000	24054	83	12	7
Cornwall	960000	26760	161	27	9
Dorsetshire	772000	21940	248	22	29
Durham	610000	15980	180	9	4
Derbyshire	680000	21150	160	11	6
Devonshire	1920000	56310	394	37	32
Essex	1240000	34800	415	27	20
Gloucestershire	800000	26760	28	27	30
Herefordshire	660000	12000	176	8	11
Hampshire	1312500	26850	253	20	29
Hertfordshire	451000	10570	120	18	8
Huntingdonshire	240000	8220	79	6	4
Kent	1248000	39420	480	31	67
Lancashire	1150000	40000	61	27	6
Lincolnshire	1440000	40590	295	35	30
Leicestershire	560000	18700	192	11	6
Middlesex	247000	110000	200	7	7
Northamptonshire	550000	2420	136	15	20
Northumberland	1370000	22740	460	12	6
Nottinghamshire	632100	29500	143	9	9
Norfolk	1148000	47180	660	33	31
Oxfordshire	534000	19000	280	12	4
Rutlandshire	110000	3260	48	2	5
Shropshire	890000	23280	170	16	15
Staffordshire	180000	23740	112	19	5
Suffolk	995000	34420	575	28	22
Somerfetshire	175000	50000	385	35	42
Surrey	592000	34220	140	11	13
Sussex	1140000	21540	312	17	65
Warwickshire	670000	21970	758	14	5
Worcestershire	540000	20633	152	13	7
Westmoreland	510000	6500	26	8	5
Wiltshire	876000	28000	404	21	29
Yorkshire	3770000	66150	536	57	26
	2530600	1068387	9684	712	673

** The above is a curiosity not easy to be met with, and

No. of Counties in Ireland.	Irish plantation Acres.	Houfes	Parishes	Baronies	Borough
Ulster 9 Counties	2836837	128983	365	55	29
1 Antrim	383020	20738	56	8	5
2 Armagh	170620	13125	49	5	2
3 Cavan	274800	9268	37	7	2
4 Down	344658	26090	72	9	6
5 Donegal	630157	12357	40	5	5
6 Fermanagh	224807	5674	19	8	1
7 Londonderry	251510	14528	38	4	3
8 Monaghan	170097	10658	24	5	1
9 Tyrone	387175	16545	30	4	4
Leinster 12 Coun	2642958	127908	858	99	53
1 Catherlough	116900	5444	42	5	2
2 Dublin	123784	23103	87	7	4
3 Kildare	228590	8555	100	10	4
4 Kilkenny	287650	13231	96	9	7
5 King's Coun.	257510	9294	56	11	2
6 Longford	134700	6057	24	6	4
7 Louth	111180	8150	50	5	5
8 Meath	326480	14000	139	12	6
9 Queen's Co.	238415	11226	39	8	3
10 Westmeath	249943	9621	62	12	4
11 Wexford	315396	11438	109	8	8
12 Wicklow	252410	7781	54	6	4
Munster 6 Coun.	3289932	117197	740	63	26
1 Clare	428187	11381	76	9	1
2 Cork	991010	47334	232	19	12
3 Kerry	636905	12112	81	8	3
4 Limerick	375320	19380	130	10	3
5 Tipperary	599500	18057	147	10	3
6 Waterford	259010	8933	71	7	4
Connaught 5 Co.	2272915	49966	330	43	10
1 Galway	775525	15576	136	17	3
2 Leitrim	206830	5156	21	5	2
3 Mayo	724640	15089	73	9	1
4 Roscommon	324370	8216	59	6	3
5 Sligo	241550	5929	41	6	1
IRELD. 32 Co.	11042642	424046	2293	260	118

Houfes included. Dublin City † 12857. * 13194
 Cork † 8113. * 7445. Limerick † 3672. * 3859.
 Waterford † 2028. * 2111. Kilkenny † 2071. * 2255.
 Belfast † 5197. * 5295. Newry † 1561. * 1600.

N. B. Five acres Irish are equal to 8 acres, 15
 perches, and 105 pts. English. The Irish measure with
 7, and the English with 5 1-half yards to the perch.

with, and is both useful and necessary in any Family.

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P R E F A C E.

THE present times of scarcity, or at least dearness of corn, seems to set every engine afloat to create a change; but this is only wind, it produces nothing further than ideas, which has no effect without practice; it is in vain to light a candle and put it under a bushel; great bodies move slow, multitudes may meet, appoint committees to scheme for plenty, but nothing is equal to precept and experience.

The Author has done more good as a single insignificant individual, by giving practical lessons along with his works of theory, than all the authors in the kingdom could have done by theory alone; but he never directed in writing what he could not give lessons upon, performed by his own hands.

It is well known by numbers of noblemen and gentlemen, that tho'

he has enforced into practice precepts to their stewards, &c. yet he never took a penny gratuity in his life, from any one.

The great progress in setting wheat, grain by grain, which is now in practice to so great an extent in Norfolk, Suffolk, &c. was at last overcome, by persevering in the practice thereof, and is now found to be one of the best pieces of husbandry extant; but notwithstanding though it is proved past a contradiction to be of so great utility, yet it has been long gaining the footing it has got, so hard it is to cause a change from the common track, it being 32 years, (as appears by the Author's works) since he first began field husbandry in setting wheat, and there is little doubt but the practice in time will become general in setting all other grain that stools and requires to be set thin. Should this be the case with husbandry in general,

ral, it will be a great acquisition both to farmers and labourers, as the farmer would lower the tax by keeping the latter out of work-houses, because their wives and children would be suited with work to their age and sex. Could we make farmers philosophers, they would not be long, coming into this practice, for indeed, good philosophers will ever be found to make the best farmers, it being a science always under their view.

Tho' the said practice of dibbling is slow, yet the sharp thorn of necessity may in time bring it general before the kingdom is arrived to the perfection of a garden, which may be the case before the world is at an end, should that ever happen. But it is to be hoped that establishing the growth of Indian-corn, will be much quicker in its progress; as most of the farmers in the kingdom will be supplied with seed, and books of direction at the same time.



INTRODUCTION.

WHAT we here presume to offer to the public is quite foreign from matters of genius and speculation. It is merely a compendium and abstract of matters of fact, of personal experiments and observations, for a number of years; and here we deliver to you the product of all that we have gleaned, with the varying allowances and respective instructions, touching the difference of the climate, the culture, and the soil.

As the utmost of our ambition is simply and clearly to convey our thoughts and meaning to the simple and unlearned; to be useful to them, we must be as plain and intelligible as our subject will admit. But should men of improved genius, of letters and precision, happen to dip into this business, we trust, that, whilst they look down upon authors so much beneath them, they will have the goodness to pardon the defects of writers, whose only aim and endeavour are to be under-

understood by the farming part of the world. But if here and there they should find any thing deserving their particular attention; if they should find some grains of wheat in the midst of our chaff, or smaller particles of gold in our dross, the honour of having contributed in any measure to their advantage, will be to us a high matter of payment and gratification.

And if the ingenious reader can improve upon any hints, he will be the more praise-worthy. The field of improvement is large enough for every one to try his talents in. A man must know much, to know every thing; a general knowledge is desired by many, but obtained by none. In short, every step that leads to knowledge, or improvement, is worthy of being marked with laurels of gold.

Our great Creator, for good and wise purposes, has diversified human nature with as many degrees of understanding, as there are external shapes in the body, and linked us so together, that we cannot live without the assistance of each other.

The political government is as much dependent upon the mechanical artist or day-labourer, for a subsistence, as the latter are to them, for any judgmatical laws they may enact, for regulating the multitude of individuals under their care.

The political system may be compared to the movement of a watch, the legislative power the main spring; should they enact such laws as are oppressive; or, on the other hand, omit those that would be useful to the community, if enacted, it would cause such a contrast in nature, as would disorder the whole system.

Though we doubt not but the political abilities of our legislature are adequate to that of any other body of men in the known world; yet, experimental knowledge, acquired by industry and attention to business, is very often wanted to plan useful laws.

It matters not from what fountain useful knowledge arise, whether from a yeoman, churchman, or a court politician; they ought for conscience sake, to be taken notice of, encouraged and enacted according to their merit, as
much

much as if they rose from the first minister of state ; and as we think it a duty incumbent upon every individual, to communicate to the public, any useful thoughts that may arise, we flatter ourselves, we stand excused for drawing up and publishing the following schemes ; and though they may not all meet with a general approbation, yet we trust, they will be approved of by the unprejudiced sensible part of mankind.

A hint to the wise is sufficient ; therefore it is enough to say, that the following schemes are only meant as outlines, or hints to be improved upon. It would swell this work beyond the bounds intended, were we to enlarge upon the merits of every scheme, or lay down every necessary clause, binding to an enacted law ; this we leave to the correcting pens of those who are judges in such matters, and doubt not but they will improve upon the hints, and clothe them out to the best advantage ; it will also be a meritorious act, and reflect honour upon every voice and pen, that assists in bringing them to maturity for public utility ; and likewise merit the
thanks

thanks of the authors, who have spared no pains in giving them birth, though they expect no other advantage therefrom, than what may flow to every individual, by wholesome and constitutional laws being enacted.



FLOATING IDEAS OF NATURE.

CHAP I.

On the White Vetch.

THE white vetch, in some degree, partakes of the nature of a white or boiling pea, as it will boil soft and smooth like that grain; and is chiefly used for making puddings; it is mild, good, and palatable; consequently very proper for that purpose.

It only differs from the common vetch in colour, which is milk white, but the shape of the grain and the straw are alike; however it will not stand the winter so well, being of a tender nature.

The proper time to sow it, is in April. It thrives best in light sandy land, and ought to be set in drills, and hoed; if it be managed thus, it will produce a great return.

CHAP.

CHAP. II.

On the Siberian, or naked Wheat.

THE naked wheat is a native of Siberia, a very barren and cold climate. The land is covered with snow nine months in the year; consequently there are only three months to till, sow, and reap in.

Their chief support of corn, is this naked wheat. This grain partakes of two species, viz. wheat and barley; one side of the grain resembles the former, and the other the latter.

It is a very quick grower, and lies but a short time in the ground before it vegetates.

It



It is a full plump corn; about five hundred grains weigh an ounce; therefore it is about one sixth bolder than English wheat.

It comes up with a very broad, strong, healthy blade, owing to the largeness of the grain, and the quantity of nitrous particles it contains. The straw is as strong or as gross as that of wheat, and the grain grows in a chaff like it.

As it partakes of the likeness, so does it of the quality, of both wheat and barley, for it makes good bread, and good drink, and the straw is as soft as that of barley.

In order to prove its value more particularly, a bushel was ground and made into bread; twelve pounds of wheat seconds, were made into a loaf; and a like quantity of this Siberian wheat was also made into a loaf, and both put into one oven. When they were baked, the English wheat loaf weighed fifteen pounds,
and

and that of the Siberian eighteen ; and the bread of the latter was as good as that of our English wheat ; neither does it produce half the quantity of bran as common wheat.

There are two sorts of this Siberian wheat ; one has a flat ear with only two rows, like that of flat, or what is called battledore-barley ; the other has six rows in one ear, and the grain in them much smaller than that in the ear with two rows. Both sorts are bearded like barley.

One bushel was malted and made into small beer and ale, both of which were very good and pleasant to drink ; and it was found to produce a greater yield than our common barley ; perhaps owing to its thin skin, and fullness of flour.

In 1767, a nobleman brought from Siberia one pint, and gave it to the Society of Arts and Sciences.

Those gentlemen judged from the look of the grain, and from the nature

ture of the country and climate it came from, that it would be of great utility to England, could a quantity be raised sufficient to feed the kingdom.

Upon which they divided their small portion among such persons as they thought would be industrious and careful enough to make the most of the produce.

A common wine-glass full was given to Mr. Halliday, of Liverpool, half of which he gave to another gentleman.

Mr. Halliday, like a faithful servant, did not hide his talent in a napkin, but by proper judgement and industry, he sowed and made it thousands, and tens of thousands, as from this small quantity has sprung, in the four last years, many hundred bushels.

The Rev. Mr. Meredith was not idle in this public-spirited undertaking. He procured a quantity
from

from Mr. Halliday, and divided it among such of his acquaintance, as he hoped would propagate it to the best advantage.

He was so kind as to send one bushel to the Editor; but he had not an opportunity to do it justice, which was owing to a disappointment occasioned by the neglect of carriers.

However, as soon as it arrived, on the 7th of June, he trench-plowed a piece of bad land, covered with heath and other rubbish, and which had lately been inclosed from a common.

On this it was sowed, and notwithstanding all disadvantages, it was a tolerable good crop, and much better than any sort of English grain would have been, had it been sowed on the same land, and at the same time of the year.

The Editor received a few grains from another hand. This was set

in a proper season, and upon good land, each grain at a foot asunder, which gave a produce of about two thousand fold.

In short it is a great multiplier; for though it will grow better than other grain upon bad land, yet if the ground be good, it will stool out, and flourish in proportion, but the greatest care must be taken not to over seed the ground.

The proper season for sowing it, is about the beginning of April. Trench-plow the land to smother the weeds, and raise a good deep mold.

Then harrow it well, but with care, not to drag up the sods or weeds with the harrow pins.

Being thus prepared, set your Siberian wheat with a dibble or setting-stick, and make the holes at one foot distance from each other; into each hole put three grains, and let the land be of what degree of richness

richness it may, doubt not but nature will force out stooling branches sufficient to fill the surface of the earth, and give a greater produce than if you crowd the ground too much with seed.

About twelve pounds of naked wheat will seed an acre, and thirteen pounds and a half of English wheat will set an acre likewise, and so on in proportion for every sort of grain, according to the largeness of the seed.

After the seed is set, cover it, by filling the holes with a rake. One man will cover at least two acres in a day, by this method; and if you please, you may sow grass-seeds before the ground is raked, and be assured they will grow, and thrive better amongst corn thus regularly set, than if sown promiscuously in the common method.

FLOATING IDEAS OF NATURE.

CHAP I.

*A few Hints offered for the Perusal
of the Freeholders in general, how
to chuse a Member of Parliament.*

GENTLEMEN,

THE schemes in the following sheets are humbly offered for your perusal, as the first principles of their efficacy, if put in execution ; the legislature is the executive body to enact laws, but you, as freeholders, are the electors of that body ; therefore, should your choice fall upon unworthy men, deficient in abilities, and, in other respects, unfit for the important seat they are to

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fill,

the fault is yours, as you must run into such errors with your eyes open ; because, every gentleman, qualified to sit in the House of Commons, ought to be a man of eminence, whom the eyes of the world are upon ; common fame generally points out his worth and abilities ; therefore, such a-one cannot, or at least ought not, to be a stranger to his neighbouring freeholders, whom he is to represent ; and if you chuse a stranger, who acts not up to your wish and expectations, you are inexcusable.

It is natural for masters or employers, through all stages in life, to be well acquainted with the talents or abilities of those whom they employ, whether they are qualified or not for the trust and confidence reposed in them.

Then certainly you, as freeholders, who have the chusing of the legislature, a power superior to all others,

others, ought to be very circumspect whom you admit into that high office, as the happiness or misery of such a multitude of people depends upon the laws they are to enact; therefore, their abilities, experience, and past conduct, ought to be strictly enquired into.

Pardon us for pointing out, what, perhaps might please, should such fall to your lot. He that is trusted with the affairs of the nation, ought to be every thing that is great and good; he should have an honest heart, sound judgment, a noble spirit, and be a lover of his king and country; neither should he be a stranger to his own country, as is too often the case with gentlemen who travel abroad; who, being asked about the constitution or commerce thereof, can scarcely give a rational answer.

If a gentleman has his country's good at heart, and would wish to

serve it from laudable and generous principles, he should travel through it, at least three or four years, and be very particular in his remarks and observations, in order to gain experience to enable him to plan constitutional laws.

Add to this, he should have the patience of Job, to hear all debates; the wisdom of Solomon, to judge of them; the resolution of St. Paul, to plead in their behalf; and dare to be honest, in the worst of times, to his king and country.

Let me, therefore, advise the constituents to consider well the abilities of those who represent them; not to be led away or biased in their opinions, by pomp, show, bribery, or fine words. It is mean, and below the noble spirit of man to be led by the nose like a bear.

Scorn to take a bribe; let all the world see, that you, as free men, are endued with a more generous and
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open soul, than to sell your freedom, and debase your understanding, even for a dinner or a treat : be not like Esau, who sold his birth-right for a mess of pottage.

What man of spirit or generosity would lay under an obligation to a gentleman for a paltry treat ? and he that takes a bribe, is a villian to his country.

There are few men who are qualified to give a vote at an election, who are not also able to treat themselves ; and consider, that a thing of the sort is scarce felt when it is divided among a great many ; but being added, and paid for by one, is too heavy a burden for him to bear, though a gentleman.

Let it be also understood by every one, that he who buys a man will sell him ; nay, he has a right so to do ; for what he buys, is his own, both by law and equity.

If you GIVE him your vote and
B 3 interest,

interest, you then lay HIM under an obligation ; he would then serve you from a fellow feeling ; it would be the greatest of sins, that of ingratitude, to deceive you ; he would make your interest his own, and give his voice to enact every useful law for your interest.

But how, in the name of wonder, can you expect it from a gentleman, who has spent, perhaps, from one to twenty thousand pounds for a seat ? the immense expense and trouble he is at, thwarts and sours his temper ; and, perhaps, out of revenge, and even contrary to his own judgment, he will give a casting voice against what might be of public use if enacted : such has been known.

In short, a man who has spent a great part of his fortune to gain a seat, will take long strides to retrieve it ; and, in his own mind, stands self-excused, for any unconstitutional

tional steps he may take for so doing.

Self-interest is a prevailing argument, and may often whisper things to quiet a man's conscience, which he thinks himself not accountable for to the world.

There are two sorts of men, who, though not proper for a seat in the house, yet generally strive to get in it; one for self-interest, and the other for ostentatious pride.

The former spends, or rather wears his money well; for, by procuring a seat, he, at the same time, has an eye upon some advantageous place; therefore all his pretended zeal is self-interest.

The latter bustles and strives hard for a seat, and talks of what great feats he can perform, if you chuse him for your representative; perhaps all his pretended zeal is pride: it has become a great thing to be a parliament man, and he will be that great man, cost what it will; he will not

be outdone by any one ; he has money enough, and sure that is sufficient to make any man great, let his other accomplishments be what they will.

But do you think so, our experienced readers ? no, certainly : you know better ; you are sensible that greatness originates from true manly wisdom ; and this is acquired only by dint of industry, and close application to business and study.

Though a man with a large fortune may be born with natural mother wit, yet it takes a great deal to make him what we may call, a clever, sensible, great man.

His large estate, in some degree, is a bar to those acquirements, as he rests secure in his independent fortune.

What little time there is to spare, in his youth, from the gay pleasures of a crowded world, is little enough for the first rudiments of education ;
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when he arrives at manhood, he is immediately sent abroad to finish it, by travels into foreign countries, in which he seldom learns any thing that is of real service to himself, as a parliament man; though, at his return, he is immediately ushered into the house, without his constituents having any real knowledge of his experimental abilities; indeed, experience he can not have, particularly of his own country, where it is most wanted.

We have no party views, but wish well to all men; and though such, as above, may be very worthy, so far as their knowledge leads, yet the odds are greatly against them; for, suppose a man's natural parts be as great as his fortune, reason tells us, that it is experience which begets wisdom, and that, is not acquired without great industry, and application to business: the more troubles and hardships a man wades

through in the journey of life, the more valuable is his experience.

It is the sharp thorn of necessity that spurs on the mind, and puts ingenuity to the rack; and, as it were, forces out those seeds of invention, which might lie hid in one, who glides smoothly and securely through an uninterrupted course of life, which is the effect of an independent fortune.

It requires little ingenuity for a gentleman to spend a fortune; any fool can do that; but he is a clever fellow that can make one, out of little or nothing to begin with.

The man who is proper to be at the head of affairs in a mercantile country, is he, who, by the dint of ingenuity and industry, has made his own fortune; who has ransacked every corner of the kingdom for materials to build it upon; and whose business has thrown him into different companies, where various con-

versations may be heard, which open the ideas, and ripen the understanding.

Man, in his natural state, is a very unpolished, rude, uncouth creature; the soul is implanted in him for noble and wise ends; but it is confined from spreading, sprouting, or growing up to maturity, as the seed in dry barren land, and makes little progress to improvement, till cultivated by art.

Necessity begets industry; industry ingenuity; and ingenuity begets experience and wealth; but, as before observed, a man born with a fortune, is, in some degree, exempted from these valuables; as he has the chief spring to action, namely money, provided to his hands.

At the first institution of parliaments, the members were paid a certain sum, or *modus per day*, by the boroughs or counties they represented, for doing their constituents bu-

finess. Pickering, in Yorkshire, was formerly a borough town, and sent two members to parliament, but lost their charter, because they could not afford to pay them each a noble per day ; a sum allowed by charter, as a consideration for the members transacting their business.

This shews a strange alteration between times in the purity of the primitive age, and those in which we now live.

In the former, members were paid for doing the public's business, which had some meaning in it ; but now they pay severely for being admitted servants to the public, which would puzzle a conjurer to know the meaning of.

It astonishes us greatly, to think how it is possible for such a body as that of the legislature, to overlook so many useful laws, as might be enacted for public utility : that someone or other of them should not find
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them out, or should stumble over every thing that is valuable: but it verifies the old saying,—what is every one's business, is no one's.

It is to be hoped, every one who reads the schemes contained in the following sheets, will give all the assistance in their power towards procuring all, or so many of them enacted, as reason points out to be useful; and we flatter ourselves, they will be really so, more particularly, as we are strengthened in our opinion by a worthy gentleman of consequence and precision, who has read them in manuscript, and much approved of them; therefore advised them to be printed for public perusal, that every one might lend their voice, where reason points the way.

It is not to be expected that the following schemes, in their present dress, stand correct, or are a true plan of what they should be, were they

they enacted into laws; they are only meant as hints or out-lines, to put the legislature in mind, that, if they think them worth their notice, they may make such alterations or deductions, as, in their wiser judgment they may think proper.

It is the height of our ambition that they take notice of our hints, and pick and cull the gold from the dross; for, suppose a few, out of many individuals, to be bettered by them, it will be a matter of high payment and gratification to those who have spared no pains or expence to be useful to the public.

CHAP. II.

*Shewing the great advantage that
would accrue to the Public, was a
General Act made for inclosing all
Commons, Forests, or Waste Lands.*

OF all the schemes that have been hitherto set on foot, for lowering the price of provisions, we apprehend none looks so plausible, for that purpose, as a general act for inclosing commons and all waste lands, which would certainly be of great utility to the public.

In the year 1772, the public were agreeably amused for a while, with a scheme set on foot, by subscriptions

tions in Bristol and London, which was, to reduce the price of provisions, relieve the poor, &c. but though the design was a public-spirited and laudable undertaking, yet a little reflection must convince every rational experienced person, that it could not answer the end, so as to be of great utility.

It was very unlikely that a few individuals, though rich, could cause a change among such a multitude of people as England contains; this, reason might dictate, and experience quickly proved it; for it soon died away, and came to nothing, without any sensible good effect to the public; perhaps a few poor in the neighbourhood where the thing happened, might gain a trifle for a time, but it was a mere trifle indeed, in comparison to the whole.

Yet, little as it is, when the fund drops, as it naturally must, (for all
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the public charities in England could not keep it up) it leaves the poor in as needy a condition as ever; nay, perhaps worse; for it may have diverted them from applying so close to industry as usual; and which they must do, though against their wills, upon the stoppage of any such public charities, which seldom hold long, when dependent upon the voluntary contributions of the donors.

If we would wish a public good, we should aim at a general undertaking; many hands make light work, is an old proverb; raise an universal emulation among the people, allure them to improvements, by voluntary acts in themselves, which promise each individual profit, and consequently, a public plenty.

This is most likely to be effected by two schemes; first, by enacting such laws, as may make it the interest of each, to apply himself to industry.

Secondly,

Secondly, by striking out proper plans for improvement; which, if plausible, will of course be followed with rapidity, whether in a mercantile way, to gather wealth from the Indies to decorate the external parts, or to our own fields, to raise food for the needy populace; and since the ingenious enterprising spirit of the times has brought home so much riches, as to give the balance of power in favour of the former, it is now become absolutely necessary to bend the minds of the public to the latter, till every corner of the kingdom is so well tilled, as to admit of no more improvement; then it will be time enough to emigrate into a foreign country, to improve that also; but as, perhaps, one-fourth of this little island is yet a barren waste, it will be some time before improvement can be at the greatest height.

It would, doubtless, be a great
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satisfaction to the public, as also a guide for the legislature to go by, were they truly informed, how much common or waste land remains unimproved, which may easily be attained, by the methods laid down in a table annexed to this work; put that plan in practice, and it will give a thorough idea of the state of the kingdom in all the most important points necessary to be acquainted with.

Till then, we can have no certainty how much of the kingdom lies waste, in commons, &c. It is judged by many, that, at least, one-fourth lies useless; which, perhaps is a moderate computation; if this be the case, was it improved, it would add to the kingdom one-fourth more riches, provisions, and also, strength to guard against an enemy; as a farm house would be quickly built to accommodate each proper quantity of land, consequently the whole would be inhabited

bited with a number of people adequate to the tillage or improvement of the same.

Here we see, at one view, the great advantage that would accrue to the public: first, it would be a means of keeping the people from emigrating to the wilds of America, as they would then have liberty to cultivate the wastes in their own country; and it is well known, that the riches and strength of an island or kingdom, depends upon the number of its inhabitants; they also add treasure to the public funds, as a duty is paid for almost every necessary of life, whether meat, drink, or apparel; therefore we may say that a man, his wife and eight children, adds ten treasures to the public funds, ten portions of strength to defend the kingdom, and ten hands to till the ground; which will bring in the end, ten times as much to the market as a single man; consequently,

quently, they are of ten times the utility to the public; and yet, many farmer's sons, are withheld from marrying, through the scarcity of farms to settle upon, which would be, in a great measure, removed, was a general act to take place for inclosing, and another for limiting the size of farms.

Let weak heads argue to the contrary, if they will, but these are facts that cannot be controverted. We have many a time heard wrong heads argue against inclosing commons or waste lands, the foundation of whose arguments are as weak as their understandings; however, though weak, they may sometimes do hurt, by throwing cold water upon useful schemes.

How often do we hear and see scriblers and talkative men exclaim against inclosing commons; that it starves the poor, depopulates the country, &c. &c. whereas, take the
argument

argument to pieces and examine it, point by point, and it will be found quite the reverse; for commons absolutely keep the people poor, and are an inlet to roguery and idleness.

It is an undeniable fact, that those people who live in villages, near, and depending upon, commons, are the poorest in England; and, indeed the thing speaks for itself; because every labourer and servant, that can, will flock to such places, to gain settlements, and take a common-right house, which intitles them to keep stock thereon: after this, perhaps, they raise a cow, and a few sheep, on which is the dependance for a wife and children to live upon. Not being half supplied with work, (as little is to be got in such places) their chief dependance is, the milk of a half-starved cow, and the produce of a few ragged, half-starved sheep, which are generally taken off once in every two or three years by
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the rot; this brings the owners either to the parish, or to beg or steal, and at last, perhaps, to the gallows; for most of the horse, cow, and sheep stealers in the kingdom, are bred in such places as are near commons.

These are the general consequences which attend people adjoining commons; if the land they consist of be naturally good, it is so much over-stocked, that it is pitiful to see how much the cattle are starved, and prevented from coming to their natural growth.

If the land be heathy and barren, the few stock it keeps, are poor, small, dwarfy, and of very little consequence, either to their owners, or to the public, by adding to the funds of provisions.

Though the above is literally true, was it so but in a small degree, the effects thereof would not be so sensibly felt by the public; but dreadful

ful it is, when we consider, that no less than one-fourth part of the kingdom lies locked up from the public, in this barren neglected state.

It is ill policy, nay, it is insolence and folly to the highest degree, not to take away this bar to improvement, and, by a general act, make it lawful for all commons and wastes to be inclosed; because, of consequence, improvement and plenty of provisions would soon follow.

What can a foreign traveller say, upon seeing so much waste grounds as we have in England? he must naturally conclude, that there is something defective, either in our laws, or spirit of improvement; or that our historical maps, &c. are erroneous impositions upon the public, by describing the kingdom much larger and better peopled than it really is, or else we could not spare so much land to lie barren; consequently unpeopled; and yet the people
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are emigrating, to improve a new world.

It would be true policy, to take away every bar, and to give every possible encouragement to improve our own kingdom. First, should the hive be too small to contain the swarm, let them, like the industrious bee, cast, or turn out, to enrich her common-wealth elsewhere.

Of all the evils before us, we ought to chuse the least ; and would be glad to know, what ill consequences could arise from such a general act, should it take place?

Perhaps a parcel of weak, ignorant farmers, who love to see a quantity of dwarfy, half-starved cattle, may exclaim against inclosing ; but they are only hurt in idea, by thinking, that they could not live without commons ; however, let such look into the state of the parishes that have none, and they will find

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there, much richer and happier people, perhaps, than themselves; therefore, little regard should be paid to such imaginary evils, and short-sighted men; they are not worthy a thought, in comparison of the many good consequences that would arise from such a public act taking place.

Again: repeated experience tells us, that a general inclosure must be a general good, from the many private acts that are procured every session of parliament for that purpose; which are no sooner obtained, but the land is inclosed, improved, built upon, and inhabited; sure this is a lesson that any one may run and read; but though 'so many private acts are daily procuring, it is only half doing the business; it is slow in its motion, and is a very great clog upon the wheel of improvement, as the trouble and expence it costs to procure an act of parliament,

would

would go a great way towards improving the land, whereas, a general act would avoid this, by doing all at once.

Should such waste lands not be immediately all improved, from the immense quantity there is, yet no ill consequences could arise therefrom, as they cannot grow the worse for lying 'till the industrious hand reaches them, which, in the nature of things, could not be far off, if we may judge by a little what much means; for now-a-days an act is no sooner procured, but the common is improved, and perhaps, built upon.



CHAP. III.

Upon limiting the Size of Farms.

IF an act of parliament was to pass, in order to put a stop to the monopolizing of land, and to limit the largest farms to four hundred acres each, it would doubtless have a great tendency towards making improvements flourishing, and plenty abound through the two kingdoms.

It would then be in the power of every one, to make the most of his ground; no corner of it would escape his eye, and lie barren. He would improve every part, and fill it with one profitable crop or other.

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It is the nature of man, in all stations of life, to be aspiring, and very often to grasp at what he is not well able to manage.

But in no case is the misfortune more sensibly felt, both by the party concerned, and by the public in general, than when a farmer holds too much land.

But suppose the farmer can struggle thro' and pay the rent, yet the public is still a loser? as the earth does not produce half the increase it would do, were it managed to the height of perfection.

Therefore, such laws as these would lay the foundation for plenty; and only such, can make the people happy and honest.

May we not compare a kingdom to a family? Is it not the first care of a master to provide bread for his family? If he neglects this, can he expect that his servants will be honest and industrious?

Are not the king and the legislature the fathers of the people? Are they not impowered to enact such laws as may appear to them to be most for the public good? Are there any that ought to draw their attention, before such as would satisfy the first law of nature?—Hunger will break through stone walls.

What good has accrued from all the laws which has ever been enacted, to prevent forestalling? Do they satisfy the people's craving appetite with bread? or make it one jot cheaper? Do they add one peck of corn to the mill, or tend towards making one blade of corn more to grow?

It is inconsistent with reason they should. In short, were some of these laws put in force, they would have the contrary effect; because they would cramp trade, which, like water, is the best leveller.

What

What would London and all our great sea-ports do, were it not for the corn-factors, wholesale butchers, drovers, or dealers in cattle, &c. It is such as these that keep an equality in prices throughout the kingdom. They buy where such commodities are plenty, and sell where they are scarce. Is it to be supposed that a farmer or grazier, who has perhaps no more than twenty quarters of corn, or three or four fat cattle to sell, and who lives a hundred miles from London, could go there to sell them? And suppose he did; must he not lay a greater price upon them, to answer such extraordinary expences? And would not this most sensibly affect the lower class of people?

The merchant's ware-house may justly be called a magazine for the poor, where they can apply for such necessaries as they stand in need of. Neither have the poor cash, or means

to provide long before such things are wanted.

It is the merchant's interest to lay in his commodities in the time of plenty, and to sell out in time of scarcity. Is not this a natural policy, that will keep things most upon an equality? Was not this the case with Joseph? He filled his stores in the times of plenty, and sold when they grew scarce, for he did not give his provisions away any more than our merchants do.

Most of the commodities or necessities for life are perishable, therefore, under a necessity of being disposed of before they spoil. Should any one be silly or indiscreet enough to keep them too long, he is punished by his own folly; but this very seldom happens.

The merchant, with a capital and ware-house proper for the occasion, is a ready market for the farmer to fly to, for the sale of his crops.

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Had he not such a resource, he would be deterred from sowing, which would be the first step towards a famine.

These are all consequences which must naturally happen, were the acts to prevent forestalling put in force. For every person that buys before the goods are brought to market, is in reality a forestaller, as the law now stands.

We may remember seeing many hints in the newspapers, relating to fat cattle being returned from the markets in London to the country unfold; and at the same time wishing for such laws as would enforce them to be sold, and not returned.

Certainly such authors judge as superficially of those matters, as the old-fashioned farmer, who for some time past, has stuffed the papers with his silly arguments, wherein he takes upon himself to prove to the public, that it was the inclosing

of commons, together with turnip husbandry, which was the cause of dearth of provisions.

In one of his letters, about Martinmas, he thanked providence for a *mis-crop* of turnips. For, says he, as this crop has failed, farmers are obliged to bring their sheep and cattle to market; which has lowered butcher's meat greatly. But, perhaps, he is one of the tribe of sleepers, which only want food one half of the year; the other, they live in a state of insensibility without it. His short-sighted understanding could not find out what would be the consequence; that the more they killed in autumn, the fewer remained for slaughter in the spring; that we cannot both eat our cake and have it.

When winter food falls short, (of which turnips are the best) the cattle must walk to market with their bones half loaded with flesh; consequently,

frequently, the poor must go with half a belly full.

The old-fashioned farmer's reasoning upon the inclosing of commons, is much the same; for he does not see the many thousand acres in the kingdom, which in their wild state will not keep a rabbit on an acre; whereas, if inclosed and improved, they might be made to keep four or five sheep per acre. And certainly the more live stock there is bred in the kingdom, the greater chance we have for plenty; because in the end, they must come to the butcher, except turnips and other winter food fail. Then, indeed, the cattle may die for want, and the poor may sew up their mouths.

It is past a contradiction, that the more waste barren land there is inclosed and improved, the more stock and corn it will raise. All which tends to plenty; because every arti-

cle that keeps nature alive, springs from the earth; consequently it ought to be our first care to make her produce abundance.

But to return to the farmers, sale-men, and butchers; (these are represented as unmerciful men by authors in the news-papers, who want some laws to make them kill the cattle when brought to market, whether it be consumed or not,) we humbly conceive such laws would be very pernicious, and put a stop to the balance of trade, which, instead of going on smooth and even, would be continually upon a flux and reflux. It would be like a weigh-pole, which children ride upon, always up and down, rising and falling; because some weeks there would be twice as much cattle in the market as is necessary for the inhabitants to consume; therefore, the meat would be sold very low,

low, or thrown away, and perhaps both.

The next market-day, there might not be half the quantity of cattle as was wanted, consequently the meat would be double the price. In this case the rich could buy, but the poor might starve.

Experience shews to the butchers, not only in London, but all over England, how much meat each market will take off.

Each knows what he killed last week. which was perhaps as much, or more than he could sell; therefore he will kill no more this week, lest it should lie on his hands.

Before such laws should take place, it would be necessary that the farmers should be endued with the spirit of prophecy or fore-knowledge; that he in the north might know on what day he in the south, at several hundred miles distance, would send his cattle to the market, lest they should

should clash with each other, and overstock it.

In short, we are of opinion, that it is as necessary to send cattle out of the market, when over stocked, as to bring them to it when scarce; consequently, the drawing farms near London, or great markets, are very useful, and may be considered as a sort of make weight, ready to throw into the rising scale, as it were, to keep a balance.

There is another set of people, who exclaim against farmers for withholding their cattle from the market; as if that contributed to the dearth of provisions.

But these notions, like the rest, are ill grounded. Every one that judges rightly, must know, that it is not the husbandman's interest to keep back from market his cattle, after they are once fat; for when they come to the height of perfection, all the food they eat is thrown
away;

away; and the interest of the money is sinking. It is the interest of every one in trade, to make as quick a return, as possible; therefore it is plain that it is the grazier's interest to send his cattle to market as soon as they are fat.

And on the other hand, the public can lose nothing by their being kept away from market, till they are fat; because every pound they gain in weight, is adding to the public fund of plenty; the more pounds a bullock gains in weight, whilst he stays from the market, the more bellies he will fill when he arrives there.

Upon the whole, it is bad policy to cramp trade in any branch, much more in that which concerns the cravings of nature.

The most prudent step would be, to lay a foundation for plenty, and there is no doubt but that nature will produce enough to satisfy her depend-

dependants. As to things being dear, it is a natural cause, which arises from money being more plentiful, as before hinted; and not from any real want, or decrease of provisions.

It is not improbable but that in process of time, wheat may rise to five shillings a peck, by gradual steps, for the same reason as it has rose from one penny to 2s. 6d. a peck; and every other commodity in proportion.



CHAP. VII.

On the Art of making light Land heavy, and heavy Land light, by the newly discovered valuable Method of Trench Plowing, and by which any sort of Ground may be kept in perpetual good Order, so as to produce good and clean Crops for ever, without any other Assistance of Fallow or Manure than what itself produces, &c.

HOWEVER marvelous this valuable method of trench-plowing may appear at the head of a chapter, yet strength of argument and experience gained from many trials, prove, beyond a contradiction, the truth thereof, and that its utility extends also to every sort of land,

land, though indeed some may perhaps receive more benefit from it than others, yet every candid reader, who will divest himself of partiality, and listen to plain reason, will acknowledge the great utility that may arise by this valuable method, particularly as the first care of all judicious farmers are to make heavy land light, and light land heavy, in order to temperate both extremes to a friendly loam, (which is the best corn mould) there is nothing equal to trench-plowing, and mixing clay with sand, and sand with clay, where each soil is predominant.

It may not be amiss to make a distinction between trench-plowing and deep plowing, as they may both seem to convey the same meaning, though in fact both the method of performing the work, and the produce in the crop, are quite different.

Deep-plowing is meant, when
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the plowman turns up a thick sod, and leaves a deep furrow or trench behind, which is generally practised when a farmer sees his land over-run with weeds, (expressed by him dirty, which, by the by, is too often the case) his method then is to plow deep, to bury the weeds.

By the word bury, we naturally suppose he concludes them (as they certainly are) destructive to his crops, by feeding upon his labour; therefore, as well as he knows how, wants to stop vegetation by burying, smothering, or killing them under a large body of earth.

Repeated experience tells him, that this method of deep plowing in some degree lowers the number of these troublesome enemies, which if not checked by this or some other method, would entirely possess themselves of his ground, by rooting out, smothering, or choaking any crop he threw therein.

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Now if we find by experience, that deep plowing is in some degree useful, by destroying part of such rubbish, it naturally follows, that their entire destruction would redouble the success in our crops ; however, by deep plowing alone we cannot expect this advantage ; for though the sod be turned ever so thick, yet as it rears against another sod, and lies hollow, it admits a circulation of air, which keeps vegetation alive, and forces up a mane or row of grass or weeds in the seams between each furrow ; therefore, it is merely impossible to kill every sort and part of weeds, so long as they lie within the reach of air, which is their life and spirit.

Indeed, if we make a fallow in a very dry summer, and plow deep and often, we may be said to have a tolerable clean crop the year following ; but in the second and third crops, and so on, we shall find the
weeds

weeds and grafs daily gathering strength again; fo that it is evident, the fallow year did not infallibly deftroy them, it only fickened or retarded their growth for a fmall time.

Docks, thiftles, nettles, fcutch-grafs, or by fome called quicks, and many other roots, will grow though you turn them a thoufand times over with the plow, or any other implement; yet they may be not only effectually deftroyed, but converted to a friendly and ufeful manure, or food for other plants by trench-plowing: therefore let us turn our eyes on this valuable method, and trace out, by found reafon, where their deftruction is practicable, and the many good effects arifing therefrom.

The word trenching is commonly made ufe of by gardeners, when they dig a piece of ground two or three fpade grafts deep, in performing

ing of which, they first make a hole as deep as they propose to dig, then they pare off the upper sod so deep as it contains any grafs or weed-roots, or any sort of rubbish, and throw it to the bottom of the said hole or trench, together with any straw or long dung, which they want to convert into rotten manure, as such are not proper for a top-dressing.

This done, they cover it with the second and third spade graft, so that the bottom of the ground, to the depth of two or three feet, now becomes the top; this is called by the gardeners trenching, though it is not practised so often as it ought; but every sensible experienced gardener will follow this method, as by it, he kills two birds with one stone, as it were, for he not only throws the sod or rubbish out of his way, from being obstructive or troublesome to him in sowing his crops,

but it is a kind of dunghill or hot-bed under them.

Scutch-grafs, weeds, or other rubbish being out of their growing latitude, and for want of air, putrefy and ferment, and every fermentation causes a friction, which naturally bring on a heat, in proportion to the size of the body that actuates it.

As for instance, the heat of a hot-bed is in proportion to the quantity of dung put together in a heap, which, if large, the heat is great also, and which is sensibly felt by putting a hand therein, and the strength of the heat abates as the size of such bodies grow less, till it cannot be discerned by the touch of the hand.

Though reason tells us there is a degree of heat in every body that putrefies or ferments, be it ever so small, even till it comes to a single straw or fibre of a grass root.

In

In short, many good effects may derive from this method of covering, or burying the upper sod, with a proper quantity of the under stratum, or maiden mold.

First, this sod, be the ground ever so poor, is interwoven with various sorts of roots, either of grass or weeds, both of which are very obnoxious and destructive to any crop we can sow therein, for they not only feed upon what should nourish the profitable plants, but they take up the ground that such plants should stand upon, and also hinders the free circulation of air, so that if not eradicated, will entirely possess themselves of the ground: and we see that the best fallows, or deep plowing, is not capable of making a total destruction of such enemies; at the best it is only half doing the work, for they soon recover and re-establish themselves, to the no small mortification of the tiller.

But

But by covering the said sod, thus interwoven with grafs, weeds, &c. with a body of mold, we not only get quit of them as enemies, but are at the same time converting them into a kind of hot-bed, dunghill, and fallow.

In short, by being thus buried, they act in all these capacities, for being covered only by seven or eight inches of earth, they cannot vegetate through such a body; it incloses them from the air, and nothing can grow without it; therefore, what juices they contain, immediately begins to sweat, ferment, and putrefy, all which causes a friction, or working of the different spirits together, some part of which fumes or evaporates through the body of mold by a steam or smoak, (if we may compare great things to small) in the nature of a dunghill, or hay-stack, when newly put together, and in the state of fermentation,

tion, our eyes and feeling can witness for the latter, and so may our reason for the former. Therefore, while it is in a state of fermentation, it acts in some degree as a hot-bed, which nourishes and enriches the earth and plants about it. when the state of fermentation is over, it then acts as a manure, and food for plants, whose fibres will naturally strike down to feed thereon; and what is yet farther in its favour, it may justly be called a fallow in reserve, and a dunghill without labour or expence, and this not only for a year or two, but will hold good for ever, because the sod that is trenched-plowed under, this year, will be effectually rotten and mellow, ready for turning up the next, and when it is turned up, you turn down another weedy sod, or furrow in its place, and thus go on alternately, turning up a dead rich mellow mold,
and

and down in its place a tired, weedy, or a grassy sod.

Be assured, that when this practice is thoroughly adopted, no manure or fallow need ever be applied, as none can be so good as such a dressing.

Nevertheless we do not exclude marling, claying, or sanding, these are generally put on to change the staple or nature of the ground, and may be as useful in this, as any other sort of tillage, but shall refer our readers to the chapters that treat on these articles; and it may not be amiss, before we quit this subject, to clear up a doubt which may arise, in regard to killing all sorts of weeds by burying them; for, says he, quicks or scutch-grass, docks, nettles, thistles, and such sort of roots, will grow or strike downwards, perhaps two feet or more, therefore how can they be buried or killed

with plowing a dozen or sixteen inches only?

However, we are to consider that these, no more than every other vegetable, can live or vegetate, without a sufficient quantity of air, and though a tap-rooted plant may strike downwards ever so far under ground, yet air is conveyed to every part thereof, by the tubes, veins, or leaders, taking it in by the external part of the plant, and which serves not only as mouths to take in nourishment, but as air-pipes to convey it to every part of the root, in order to keep vegetation alive.

But on the other hand, if six or eight inches of the top of any sort of plant be taken off within the ground, and the remainder of the root covered with so many inches of mold, it will effectually smother and stop it from growing, as a few inches of earth over the crown of a plant, of any kind, will stop the circula-

circulation of air, therefore cause a destruction of the root.

It is with the vegetable as with the animal creation, for neither can subsist without air; a land animal will live when put into water, provided the mouth or nostrils be above the surface, but if these be covered with water only an inch, then the creature drowns, because this body of water keeps out the air from circulating to other parts of the body of the animal.

Thus it is with weeds or plants of any sort, for if any part of a plant come to the surface of the earth, it takes in air to keep the whole body thereof alive, whereas if the whole be covered, so as to exclude air from any part thereof, that plant must immediately die and turn to corruption.

All the difference between a land animal drowning with a small body of water over it, and a plant requi-

ring a larger body of earth is, because water being a smooth glassy surface, a thin sheet will exclude air from entering therein; but earth when under tillage breaks into lumps or clods, and is sometimes intermixed with stones, consequently keeps the mold loose and open, which admits air through it.

Therefore, if the plants be not covered with six or eight inches of mold, they may be supplied with air through some of these cavities, and the rougher the ground is, the greater chance they have to meet with this supply; for the finer the ground, the closer it falls; and to help to consolidate it the more, it may not be amiss to run land that is trench-plowed over with a heavy roller; by such precautions there is not the least doubt but that you may smother every sort of weeds with six or eight inches of mold over them.

On

On a journey to Scotland, and in an open town field, near the city of Glasgow, we found a great many labourers at work, trenching ground, some two spades deep and a shovelling, for which they are paid from forty shillings to three pounds an acre, according to the depth they go; we saw plainly that the success in their crops, by this method were not doubtful, for as their land had been trenched two or three years before, the earth they threw up from the bottom of the trench, was as black and rich as garden mold.

As this work was performing in an open town field, there were ridges that belonged to farmers who never trenched their land, upon trying these ridges, at two or three spade grafts deep, we found the under stratum a red hungry sand; therefore it was evident, that by trenching, the nature of the soil had been changed, and when the crops

D 4

began

began to appear, it was easy to point out every trenched ridge in the field, by their aspect, being better corn, and clearer of weeds.

An experiment partly of the same nature was tried by a gentleman in one of our sugar islands, but now lives near the city of York; though the distance is great, and the climates in those islands, much hotter than England, yet the nature of the land is nearly the same.

The land on which this experiment was tried, and where the sugar-cane grows, is sand, the understratum is a hard binding gravel.

The gentleman who tried the experiment, said that it is sometimes customary, after they reap the first crop of cane, to let the land lie unmolested or uncultivated, and it will bring a second crop, which is inferior to the first, yet as it is attended with less expence, answers sometimes very well.

A plan-

A plantation containing six acres of cane was reaped, and the land was let lie for a second crop, but observing that it promised to be bad, the said land was trenched to a good depth, the upper stratum was buried, and in its place turned up a hard strong gravel, so that the land had more the appearance of a gravel walk than that of a staple for any thing to grow in.

This being a thing quite out of the common method, the eyes of the planters were upon it, and the opinion of every one was, that the land was spoiled; some would have it that it would never grow any thing more, others, that it would produce a plentiful crop of thistles.

In short, the six acres were planted with sugar cane, and contrary to all their expectations, produced a wonderful crop, which were two hog-heads and a half of sugar each acre,

besides the offals, which more than pays all the expence.

This shews that trenching ground in any climate or land is profitable.

In Mr. Young's six-months tour, is noted an experiment tried in trench-plowing by a very worthy gentleman, near Crakehill, Yorkshire, which seems to corroborate with all the experiments that has been tried or met with, and we cannot do greater honour to Mr. Young, than to give it to our readers in his own words, which are these following:

The capital improvement effected in tillage, consists in trench-plowing. In the year 1765, was plowed eleven acres of land, the rent of which was seven pounds; it was first cut by a paring wheel plow, worked by three horses, and then came a strong wheel plow, drawn by two oxen and six horses, by which means a depth of ten inches
was

was gained, and the eleven acres was finished in eighteen days; a man followed the plow, to tread down the fods, six out of the eleven acres were sown with barley, and produced as in the following table:

	l.	s.	d.
Six acres produced twenty-one quarters three bushels of barley, fold for	28	7	0
Three acres and a half were sown with turnips, and fold for	14	6	1
They were fed off with sheep, and kept thirty-nine for 18 weeks			
Another acre of turnips was fold for	4	0	0
Besides these articles, the field produced five bushels of tares	1	0	0
Two bushels and a half of white pease	0	10	0
D 5		Thirty	

Thirty bushels common

potatoes	-	-	3	0	0
Nine ditto early, at 3s. per			1	7	0
Which is per acre	-		4	15	5
			52	10	1

This crop is upon the whole very considerable; the land was before supposed to be very bad, and the rent was trifling; besides, this species of improvement has been generally supposed to operate very little at first, the sourness of the understratum of the soil requiring some time to be sweetened and meliorated by the influence of the atmosphere, so that such product of the first crop must be thought a very great one.

OF NATURE. 85

l. s. d.

In 1766, four acres of this field were sown with barley, and produced 19 quarters, the price not minuted, let us calculate as before, 27s. per

25 13 0

Six acres and a half yielded turnips, sold at

- 16 10 0

Fifty bushels of potatoes, at 2s. 6d

- - 6 5 0

Which is per acre

- 4 8 0

48 8 0

In 1767, the field was cropped with maslin and barley, four acres of the first, produced ninety-two bushels, sold at 4s.

6d per - - 20 6 0

Six acres of barley produced twenty-nine quarters and five bushels, at 23s.

34 1 2

One acre not sowed.

Which is per acre

- 5 8 8

54 7 2

This

This experiment, which is particularly valuable, proves in the strongest manner, the excellency of the practice. If the result of three years' experience, does not satisfy the most cautious cultivators, I know not what will. Our author still goes on, and says, In 1766, the said gentleman trench-plowed in the same manner as before, another field of five acres, and harrowed in oats on one part of it, and beans on the rest; the crop was, viz.

	l. s. d.		
One hundred fixty-seven bushels of oats, at			
2s. 6d. - - -	20	17	6
Twenty-eight bushels of beans, at 3s. 6d. per	5	5	0
Which is per acre -	5	5	10
	26	9	6

We cannot help taking notice, that both the tryer and compiler of these experiments, seem to have no
idea

idea of the grand point, namely, that of again turning up the sod when the roots, &c. were all rotten and turned to manure, which would certainly be the case, by the time the first crop was reaped. It appears that the success in crops was all produced from a maiden earth, without any assistance from manure; but if the whole surface had been turned up, when rested or rotten, by an interior fallow year, the proprietor would have found it enriched beyond expectation, and might have promised himself, if possible, a double return, and it might have been worked with two horses in a plow, as the land would be light and mellow, after the first breaking up.

We have had several experiments tried on different sorts of land, and every one proves beyond a doubt, that of all the improvements, none is equal to trench-plowing.

A TABLE

*Of the Expence and Profit of an Acre
of Trench-plowed Wheat.*

	l.	s.	d.
To the rent of land, be- ing grafs, and plowed at Michaelmas -	0	16	0
Tythe for the faid acre	0	5	0
Plowing - -	0	12	0
Seed - - -	0	7	9
Sowing, harrowing, and rolling - -	0	2	6
No weeding, as there was not a fingle weed to be feen.			
Reaping and drawing into the barn - -	0	9	0
Total expence	2	12	0

To

To 41 bushels 3 pecks of
wheat, at 5s. 3d. per
bushel - - - 10 19 $2\frac{1}{4}$

Clear profit from this acre 8 7 $2\frac{1}{4}$

The straw pays for thresh-
ing.

CHAP. VIII.

How to fix the Plow for Trench-Plowing.

IN the foregoing chapters we have endeavoured to quote circumstances, and to enforce reasons, in order to prove the utility of this valuable method of trench-plowing; in this chapter we come to the application of the work.

Though several learned authors have admitted both of the value and probability of trench-plowing, yet we do not remember one, who has entered heartily upon the cause, or has pointed out a method how the farmer could perform the work with any reasonable degree of expence.

Mr.

Mr. Randal indeed went so far as to invent trench-plows, and advertised them at ten pounds a set, but this was both too high in price, and too perplexed or complicated in working, ever to gain a footing among the common farmers, therefore the scheme, though laudable and praiseworthy, fell to the ground almost at its birth.

But notwithstanding Mr. Randal's scheme failed, we do not in the least despair of seeing this valuable method of trench-plowing become general among the farmers, particularly as they may perform the work in an easy cheap manner by the common plow, with little alterations; for not any thing deters them more from putting any scheme in execution, than a shew of expence.

When we have fixed upon the ground to be trench-plowed, our next step is to try the depth or staple of the soil with a spade, and
from

from this we can judge what depth we would have it plowed, and fix the plow and irons accordingly.

If the land be good and deep, the weeds, and grass runs deep also, consequently the upper stratum, or what compiles the sod, is thick; in this case the first plow must be fixed so as to run quite under all the roots, by which the next furrow, when turned, will be all fresh mold, or what is called maiden earth.

This being turned over the first furrow, which now lies at the bottom of the trench, is what the corn is to grow in the ensuing year, therefore must be a proper depth or thickness for that purpose.

If the land have a tolerable good bottom, you cannot go too deep, but if it be a very tough, hungry clay, or a poor red or white sand, in either of these cases, it may be prudent not to go so deep the first year, as clay will be worse to break
into

into small particles; but whether clay or sand, it may be too deep for the roots of the plant to penetrate through, in order to feed in the under stratum, and which they will stand in need of, in such poor soil.

Therefore, in such land go a moderate depth the first, and add a little more the next trenching, for an ensuing crop.

Any common plow without altering, will turn the first furrow, and all that is wanted in the next, is to add to the mold-board a cast-off board, in order to raise the second furrow over the first, and which is fixed after this manner, viz.

The first thing you are to observe, is to have the wing of your share so broad as will cut your furrow clear the breadth you intend it; suppose it be ten inches broad, the share must be also ten inches, measuring from the point of the wing to the land side, in this case the wing will be
about

about five inches. You must have a thin plate of iron, about two inches and a half broad, welled across the upper side of the wing of the socket, stretching from the breast of the plow to the point of the wing.

About half an inch of one edge only is to be welled, the remaining two inches is to remain open, in the nature of a flat socket, to admit a thin end of the turn off board therein.

The said turn-off board must be about four inches broad, and so long as will reach from the wing of the socket to the brich of the plow; it must be about two inches thick, and must have a bracket at the under side, in the nature of a foot of a fender, which bracket must bear upon the mold-board of the plow, in order to strengthen the cast-off board, that it may bear the weight of the sod when it rises.

There must run horizontally through

through this board, a small iron bolt ; one end must be crooked like a T, this is to go into a long nick, made in the breast of the plow ; when in, it must turn half round, that it may hold fast therein, by which means it will bind fast the turn-off board to the mold board.

Without any other help than this bolt, the bracket under, and one end being made thin to go into the socket, that is, in the wing of the share, it will be sufficiently strong.

As many inches thick as you have turned the first sod, so many inches the hind part of this board must be raised from the sole of the plow, measuring at the brich, so that the sod (as soon as it parts from the wing of the share) rises gradually till it comes to the brich of the plow, then it turns fairly off, and it falls upon the first furrow.

This is all the addition or alteration that is wanted, for performing
this

this great and valuable piece of work of trench-plowing; it is so simple and easy, that no doubt but any common plowman may fix it, and the whole expence cannot be above one shilling.

The plough known by the name of the Yorkshire or Rotheram plough, invented by Mr. Varlo, is the most proper to perform this work.



CHAP. IX.

Shewing the proper Seasons for Trench-plowing, together with a few philosophical Reasons relating to the Salts in the Air.

HAVING been very explicit in the foregoing chapters, in shewing the utility of trench-plowing, and where it operates or takes effect for the good of the crop, there only now remains to point out proper seasons for performing the business in, with two or three philosophical remarks thereon.

The farmers common notion of summer fallows are, that what good they receive is, by being in a state

E

of

of rest for one year, and by turning up the roots of grafs, weeds, or such like obnoxious plants to the sun, in order to be killed by the heat, when exposed thereto.

They have no notion of the atmospheres discharging the oils, salts, or manures it contains upon their furrows, such thoughts may be too sublime for their understanding.

We do not deny but their intellects may be as strong as those of other men, but we refer to any sensible reader, if their ideas in general are not much confined; which is very surprising, when we consider that their daily business lies more among the works of nature, than that of any other set of men whatever; consequently must afford more matter for philosophy, which brightens the mind, and opens the ideas to a refined understanding.

A better reason cannot be given
for

for a farmer's want of penetration into the works of nature, than a familiarity of his being always among them, by which his wonder ceases, his curiosity is satisfied, and his enquiry at an end.

The returning seasons put him in mind to sow, and so does the crop when ripe to reap; his eyes convince him of the beginning and ending thereof, and therewith he is satisfied, without penetrating farther into the wonderful cause thereof.

Experience tells him, that a great quantity of dung forces him a good crop of corn, and is not wanting also to raise him a plentiful one of weeds.

This he sees, but since labour and expence will eradicate them, he troubles his head no further about it; when his land is tired of corn, and overstocked with weeds, his next ingenuity is to rest it, and kill his weeds by a summer fallow.

This course of husbandry chiefly takes in all his curiosity or enquiry into the works of nature.

The proper season to begin trench-plowing is about Michaelmas, for the following reasons; First, because by that time we reap the profit of the present year crop. If stubble land be the object for trench-plowing, let it be done as soon as the corn is got off, in order to bury the stubble, grass, or weeds, whilst they retain their juicy particles, which will add much towards rotting, fermenting, and enriching the earth; and since this method of burying them, answers a better purpose than the summer fallow for killing them, we have no occasion to lose a year's profit, and much labour in plowing on that account.

Secondly, we may sow any crop we please, suppose wheat after wheat, it matters, not since what mold produces the last crop is buried, and turned

turned up in its place a fresh maiden earth, that must be the chief support of the present trenched crop.

Thirdly, if the under-stratum be turned up in the latter end of the year, it will be subdued, brought to temperance, and enriched by the winter's snow, frost, and atmosphere, which, let the farmers think what they will to the contrary, contributes more towards enriching their land than the summer's fallow; and would they come rightly into this way of thinking, they would not let their land lie in a close dormant state all winter, but plow it and leave it open, in order to receive these benefits; but it may not be amiss in this place to give a few philosophical reasons, how the air becomes impregnated with salts, and how they ascend and descend to enrich the earth, &c.

As no proof is so convincing as

ocular demonstration, we shall refer our reader to a simple experiment, which he may try by an onion, viz.

In the middle of the winter, when onions are in their most dry and light state, weigh one very exactly, then tye a thread round it, and hang it up at the top of a room, where no part thereof can touch the wood or any other matter.

As soon as spring puts in, it will begin to grow or vegetate into a long top; when it is in its most vigorous and juicy state, before it begins to weather, weigh it again, and you shall find its weight augmented surprisingly, perhaps one third.

It is quite clear to the weakest understanding, that what it increased in weight was collected from the atmosphere, as it had no connection with any other matter that could afford this addition.

Now since it is obvious that the atmosphere or air is impregnated with
oils,

oils, salts, or sulphurs, which act as manure or food to the vegetable creation, our next problem is, how it came there, and this we can trace from various causes.

But nothing is better known and more clear to every farmer, than that foot is a good manure, and also that it is a collected substance from various bodies, such as coals, sticks, straw, turf, earth, water, candles, oil for lamps, the steam of boiling pots, &c. All these, or as many as are burned in a room, evaporate and arise up the chimney, which is purposely contrived as a passage for the air, and which attracts and takes with it all evaporated matter; and though we find great quantities of those cling or adhere to the sides of the chimney as foot, yet both our eyes and reason tell us, that much greater quantities escape, and rise into the firmament.

Besides all these bodies usually

consumed in houses, which are very great, there are also other sorts which arise from natural causes, such as the steam and smoke of dunhills, haystacks, or any such matter, when in the state of fermentation; likewise the burning of lime, bricks, and burn-beating. In short, all the animal creation assist in sending manures into the clouds, both by evacuation and steam from their nostrils, &c.

It is true, some things produce more salts, and richer vapours than others; as for instance, suppose we lay together two or three hundred weight of coals, and throw upon them five or six gallons of water, set the coals on fire, and they, together with the water, shall all ascend in smoke, except a few pounds only of ashes.

At the same time, if you burn in the same room ever so many candles. they shall all evaporate imperceptibly, mix with the smoke, from the aforesaid coals and water, and all
unite

unite and join in the natural cause of composing three of the elements, namely, air, water, and earth.

All this is plain to the eyes and reason of any man ; but how these bodies should be divided or separated, and again descend as manure, &c. is another question, and perhaps not within the comprehension of every one.

From all the foregoing remarks and observations, we see the immense bodies of matter that evaporate and arise into the sky. All the clouds we see floating about in the firmament, are composed of earth, water, and air, sometimes the fourth element, fire, intrudes therein, which causes a convulsion, from which proceeds thunder and lightning, as fire and water cannot agree together.

The water is exhaled, drawn up or attracted by the heat of the sun, at different periods ; the earth is divided into very fine particles, and mixed

therewith, so that these two bodies being incorporated, are borne up in smoke by the air and exhaled by the sun, so keep ascending till they come at a pure, fine, thin, serene air.

Being arrived in this latitude, the heat of the sun, together with the thinness of the air, rarifies and divides the salts, oils, and earth from the water, for the air in this region is so thin and fine that it is impossible for any gross matter to remain therein, without undergoing a rarification, that causes a separation of particles.

The two bodies or elements of water and earth being thus divided, descend again to our earth, one in clear rain water, and the other imperceptibly in snow, mists, fogs, dust, &c.

Every farmer will admit that snow is a great enricher of land, which may be accounted for in this manner, viz.

When large bodies of water and
earth

earth ascend into the upper rigions, and when in the act of rarification there comes a cold easterly wind, which causes a great emotion, agitation, or tumultuous friction in the firmament, by which the waters are tossed, tumbled, and chaffe to such a degree, that they are raised into a white froth, and whilst in this frothy state, the extreme coldness of the air congeals and binds the earthy particles up with the water, so that both descend, as snow upon the earth, and when melted or dissolved, the water returns to the drains, but the earth or salts remain on the ground, and acts an manure, which we may see immediately take place.

For after every snow we may discover the earth (particularly plowed land) very light, open and spungy, which is very plain, that some oils, salts, or sulphurs, had penetrated therein and caused a fermentation, or we should discover no more alteration

in the mold after snow, than after a heavy shower of rain, which makes it generally remain sad and close.

A great deal of these enriching qualities also descend in the time of frosts, which penetrates, works, lightens, and enriches the earth, which upon the frost going away is easily discovered.

We have gone through these allegations, in order to prove the value of winter fallow, or opening the ground to receive all these benefits.

Therefore point out the latter end of October as the best time for beginning to trench-plow.

For as we turn up a dead inactive earth, the snow and frosts, (as before observed,) will not only subdue and temper it, (if hard and stubborn,) but also raise it into a lively fermentative action, and cause it to become friendly and mellow.

All the aforesaid reasons prove beyond a contradiction, both the large
quan-

quantity of manures the air contains, and also how it ascends and descends to enrich the corn-mold; but however, notwithstanding all this, the under-stratum of some grounds will be so barren, that a top-dressing of some fine manure, such as lime, ashes, pigeon-dung, malt-dust, or a compound of manures, may be adviseable to throw on with the first crop.

But if the farmer's situation be such, that he cannot provide himself with any such manure, his next forecast must be, to sow such crops as will do best without manure, and at the same time should they miss, he may have no great loss therein, as for instance.

Should the land be ever so poor, and whether clay or sand, if it be trench-plowed in autumn, it will grow vetches for a winter crop, and be the earth ever so dead or inactive aforetime, if any one thing begins to
grow

grow therein, it naturally brings on a lively fermentation, and when the crop is off, the roots become a manure; vetches is an excellent crop for such trenched land, for several reasons, particularly if eat on the ground with sheep or small cattle.

First, because the expence of the seed is but a trifle.

Secondly, what fodder it produces is in a manner clear gains, as they do not take the year's rent upon them, being sown after the crops are reaped, and may be eat off the ground time enough to sow spring-corn thereon.

Thirdly, by the trampling, urine, and dung of the cattle, the time they are eating the vetches on the ground, the land will be much improved thereby, so that it will be in condition for any crop the ensuing year.

A farmer seeing all these advantages, and comparing them with his
own

own situation, and state or staple of his ground, may apply such dressings, or sow such crops, as in all appearance, will afford him the most profit, and also bring his land into the best condition for the future, with the least expence.

If the land be trench-plowed in the latter end of the year, and not sown with any crop till spring, it may not be amiss to give it a thin plowing just before sowing with great care, though not to touch or turn up any part of the under sod.

Then sow the seed you intend, and harrow it in, which having no sod to tear in pieces, it will be easily wrought, and fear not but you will reap more profit from this method of trench-plowing, than any other whatever.

CHAP. X.

The Author's Opinion on Smutty-Wheat; from what it proceeds, and its Cure.

SMUT is a black substance, inclosed by a tough skin, when broke falls to powder; and though many authors have warmly and learnedly handled this subject, yet we humbly conceive they have dropped short of the real cause from whence this misfortune proceeds.

We have turned over most authors on this subject, and find several have stumbled on part of a cure, though none have hit upon the right cause.

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The strength of every argument is known by the reasons quoted therein; neither can any argument be good or well grounded, that will not bear sifting or trying to the bottom.

In order to open the ideas of our readers as much as possible, we shall give a few quotations, as follows :

In 1764, a paragraph appeared in the Dublin Journal, of a farmer in Cheshire that sowed a field with wheat, one half of which was marled, and the other dunged; the dunged part was smutty, but that which was marled, was not. The said paragraph also desired an answer from any one who could solve this mysterious point, but was not answered.

In the summer of 1769, a piece of wheat belonging to one Mr. Clarke, a farmer, near Bungey, in Suffolk, which contained about seven acres, four of which were the smuttieft ever seen;

seen; upon an average, it was computed that the third part was smutty, but the remaining three acres were very clear of smut.

This was a curiosity which brought many people to see it, and staggered many who pretended to be connoisseurs in this mysterious point.

Clarke said he pickled the seed all alike in salt and water, strong enough to swim an egg, and limed it till he brought it to a consistence proper for sowing, and sowed it all within the space of three days, which proved dry weather; the field likewise was summer fallowed, and all got plowing alike.

He was told that he threw the disease into the ground by his manure.

Upon my word, answered Clarke, that may be the case, for I dunged the smutty part, but the other I manured with a black mud or sludge

I raised

I raised out of the bottom of a pond and other ditches.

This immediately corresponded with all concurring circumstances.

Upon this, we went to look at the wheat, and by pulling up many roots of the smutty corn, found innumera- worm-holes in them; but as the weather was very hot, and the ground dry and sandy, the worms had retired deeper into the ground for moisture, therefore could not come at them, having no spade in the field.

The above is a convincing proof, that the disease came into the ground by the way of the dung, as both the land, seeds, and management, were all alike.

It was also evident that the pickle of salt and water (though strong enough to bear an egg, in which the seed was steeped a winter's night) had not efficacy enough to prevent the vermin brought in by the dung,
from

from preying upon the roots of the corn.

Clarke laid the dung on when in the state of fermentation, smoaking hot out of the foldyard, at which period the flies or insects were in their greatest vigor, and their eggs most likely to come to perfection.

This also shews the great mistake in farmers not laying their dung in heaps, and giving it time to ferment, rot, and cool, before they lay it on the land, that these vermin may be smothered in their infancy, and not taken out in the dung, to prey upon the fruits of their labour.

Some authors assert, that smut proceeds from the ground being wet, but the above accident quite destroys such an argument, as this was remarkably dry sandy ground.

A similar case happened to the editor, who sowed a field with wheat, which was bought at a distance ; it

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was pickled with salt and water strong enough to bear an egg.

The field was manured in different parts, viz. with horse-dung, lime, foot, coal-ashes, and pigeon-dung.

The consequence was, that the wheat as far as the dung reached was smutty, the rest of the field was quite clear. This naturally led to find out the reason thereof; and in examining the dunged part, by pulling up the stubble, &c. we found the ground particularly full of grubs or worms of several shapes and sorts; which no doubt were the offspring of the usual inhabitants of dunghills, such as flies or insects of diverse sorts, which drop their eggs therein, and by the heat, fermentation, and putrefaction of the dung, these vermin are brought to life and mischief.

The nicest observations we can make, and concurring circumstances
herein

herein quoted, leave no room to doubt, but smut proceeds from a worm or grub; and if it be not the red or cut worm, it is of that nature; we have taken a small grub of that likeness out of a root of smutty wheat, and have very often found rusty cankered traces of worms in the roots of corn.

About the last of May and beginning of June, wheat is shooting into ear; and the ear is no sooner out of the stem or straw, but the skin of the grain is formed and filled with a soft, pulpy, milky substance.

At this crisis, the worm or grub seizes upon the root of the plant, and feeds upon the fine particles or juices thereof, which ought to ascend to nourish or feed the grain. And though so small a worm may not take in all the juices belonging to an ear of wheat, yet, by making an orifice to feed out of, it wounds the plant and gives vent to the sap, so
that

that it bleeds (as it were) itself to death.

A root of corn, by branching or stooling, may produce thirty or forty stalks or ears, and each ear takes in its nourishment from the main root, by a vein or leader purposely placed to feed through.

If the worm or grub should seize upon the said vein, and feed upon what should supply nature, doubtless the milky substance already inclosed in the skin, would dry up, and become a black powder, or dead substance, for want of farther nourishment; in short, it is very possible for one grain in the middle of an ear to be smutty, and the rest not hurt; as doubtless each grain has a vein leading from the root peculiar to itself, through which it takes in its nourishment; but we believe it impossible to account for this in any other way than by a worm or some such insect
seizing

seizing the vein peculiar or belonging to each grain.

There are three stages or periods, in which corn may be spoiled by these vermin, viz.

First, when they prey upon it, after it is in the ear, but before the grain is formed. When it is caught in this state, chaff falls off, and leaves standing a naked stalk; this we have seen often happen even in all sorts of grain.

Secondly, (as before observed) when the skin or bran-part of the grain is formed, and tough enough to hold the soft milky substance, but before it is formed into a solid body, then the vein is wounded, and nature stopped from fulfilling her office; therefore, what was already in the skin, for want of farther supply, dries, and becomes a black, light and lifeless powder, much like lamp-black; but as the skin or bran is tough, it is confined therein, in the form of a ball;

ball; and when it comes under the flail, it is burst and let at liberty, like dust among the corn, and hangs at the downy end thereof, so that when it comes to be ground, the flour and bread is made black and disagreeable to the eye, but indeed not to the taste, as the palate cannot preceive any disagreeable taste it has: and, if the wheat could be threshed or got out without bursting these balls, it would not be of much ill consequence, as the balls are so light, that they might be easily separated from the heavy corn by several methods.

Therefore it is best for a farmer who is troubled with this malady, not to thresh, but lash such corn. and winnow the seed, with as little mixture or treading on as possible.

Another good method is, to leaze or pick the smut out before it is threshed, but it must be a nice discerning eye that does this, as some ears of smut are much like the good corn;

and if one ear or two be left in a sheaf, it will spoil the colour of the bread.

The third stage in which wheat is seized, or obstructed in its feeding or filling, is when the grain is about half ripe; then the worm seizes it, and being deprived of farther nourishment, it dries and shrivels up to a small weesened flinty grain, and though it is small, yet, by its firm texture, one might expect it to produce a little meal; but upon inspection it is found to be almost as hard as a flint, and of no use. This is called by some of the English farmers, flints; and by others, trucks.

The above considerations are more than a probability, that a worm is the cause of smut; yet we hope what is to follow will make it appear much stronger in its favour; we say hope, because, if we are acquainted with the disease, the cure is more certain.

It is allowed by most writers on this subject, that pickling wheat will prevent smut: this we readily admit, but however believe, that some pickles commonly made use of will scarcely prevent it; and as firmly believe some others to be effectual.

But give us leave to ask such authors, how they propose these pickles to operate? Do these authors, who believes that smut comes by a blast, imagine, that pickle could prevent the wind from having any power over the plant? And was it not both a very partial pickle and wind, that would prevent all the Cheshire and Norfolk farmers fields from being smutty, as well as that part which was marled; likewise the editors, as above stated, and several others which have had the like trials, and met with the like impartial winds?

Again, doe such authors, who place the reason of smut to the account

of not changing the seed, believe, that if the pickle had power to prevent the feed, bought three or four miles off, from being smutty, that it should not have the same power over seed grown in his own land? Or do they really think, that it is any more possible for smut to grow and taint any other corn than lamp-black; seeing it is as utterly divested of every vegetating quality?

We have sown very smutty wheat, variously prepared, both with and without pickling, but never saw that it was attended with any bad consequences arising from smut: and if the seed were good, otherwise we should never be deterred from sowing it, as it is clear to us smut is not the occasion of smut, it being as possible for a bit of dry powder, out of a rotten stick, to grow, or taint others, as smut.

Often has a subject started amongst a club of farmers, who perhaps
would

would be of as many opinions as there were people in the company, one asserting that steeping in salt water would prevent smut, another that it would not, a third vouches smut to grow smut, a fourth that it will not, and so on.

But now again, if we turn our eyes on the worms, we shall find it as clear as the noon day, where the pickles operate to prevent them from feeding upon or wounding the plant as above; we shall also find, that the more nauseous or poisonous the pickle is made, the more likely it is to be effectual in its purpose.

Wheat being put into a tub of pickle, the skin or bran is the first that imbibes the liquor, and the thick glutinous part thereof sticks, clings, or gathers to the skin; and when the lime comes to be added, it incloses, coats, or candies the grain, by which there remains a kind of

crust, which retains its nauseous quality for a long time.

Now we are to consider, that the skin or bran never grows or leaves the ground, but remains encircled with the root, which grows and spreads round it; this is a plain truth, which may be immediately proved by pulling up a root of stubble, and upon examination it will be found, that the husk is quite uniform, and nearly resembling a blown egg, having a hole at each end, one to let out the root, and the other the top; and though the grain be buried deep, yet in a general way it will rise to, or near the surface, and generally stands perpendicular.

The inside or floury part of the wheat, being all fled, changed, or grown into root and branch, we might expect, that as the bran is left a dead lifeless body, it would putrefy, rot and fall to dust; but, on
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the contrary, it will (if the stubble be not trod or molested) preserve its perfect shape for some time after the corn is reaped.

This is easily accounted for, as it is the pickle which preserves it, and the stronger the pickle, the longer it will maintain its strength, both of smell, taste, and texture; which stinking quality is susceptible to these delicate, deminutive creatures, whose sense of smell is the main guide they are possessed of, to conduct them to their food; and we apprehend it would be impossible for one of these worms to live in, and feed upon a root of wheat, that contains this stinking pickled bran or husk.

If a farmer do not dung his land, but enrich it by often plowing, as hinted in several parts of this work, it is a very great chance if he will have a grain of smut in his wheat.

This is also easily accounted for, and makes good our assertion of

being the cause thereof, as another reason may help to evince, as follows.

A farmer had a field that was always subject to smut; the land was examined, found it had been much dunged, was very rich, and crouded with many sorts of worms.

At that time indeed we were not acquainted with the pickle that would prevent it; and he had used the salt and water pickles to little purpose.

We therefore advised him to plow his field every month in the year, both winter and summer, when under fallow, which he did, and soon cleared it of vermin. The crows and birds of all sorts, followed the plow, and picked up every insect they could find.

The plow coming so often in a place disturbs and breaks up their nests or dens, so that they are prevented from breeding, and the old

ones

ones being exposed to the fowls of the air, their race is soon extinct.

It is well known to most farmers that red worms are most predominant in fresh or new land, (that is) such as has lain a long time in grass, which has given time for these inhabitants of the earth to breed; but upon the ground being turned, and the grass which used to be their food being destroyed, and corn substituted in its place, they feed greedily upon it, and destroy many a good crop of corn.

Upon old going land they are seldom found, or at least, so thin as not to do much mischief. And how can this be accounted for otherwise than that, as long as the land lieth in grass, the worms can breed and feed unmolested; but when disturbed, they meet with the above consequences of being destroyed by the feathered creation.

This again shews the value of tillage, and how assiduous and active every one ought to be to promote it.

CHAP. XI.

*On planting, in general, Forest-Trees
of all Sorts.*

THE improver is to consider planting in two different lights, one for pleasure, and the other for profit; but if he have a taste and judgment, he may join them both together, and fetch profit out of pleasure.

The pleasure consists in judiciously transplanting a mixture of various sorts of trees, so as to make a diversity of shapes, such as serpentine walks, clumps, groves, hedge-rows, &c. some to come early into blossom or leaf, and others late; some of one colour, and some of another.

When a wood, grove, or hedge-row, is thus variegated with objects differing in colour and shape, it gives delight to the eye, and pleasure to the mind, but doubly so to those who have a contemplative turn to muse upon the works of nature. What can be more delightful, or even heavenly, than for a person of business to retire from the cares of the busy world, a few hours, into a well-planted grove? There every object he sees invites him to contemplate upon the works of his Creator.

The feathered creation also are warbling out their various notes, in their Maker's praise, and telling man (the favourite work of God) that they were all created for his pleasure. A poet might well in raptures break out as in the following lines :

My God I love, and I adore !
But souls that know would love thee more,
Whilst I on earth do hide, and stand
Behind the curtain of thy hand ;

Thy

Thy hand unseen sustains the poles,
On which this huge creation rolls!
The starry arch proclaims thy power,
Thy pencil glows in every flower;
In thousand shapes and colours rise
Thy painted wonders to our eyes;
While beasts and birds, with lab'ring throats,
Teach us a God in thousand notes.
The meanest pin in nature's frame,
Marks out some letter of thy name.
Where sense can reach, or fancy rove,
From hill to hill, from field to grove,
Across the waves, around the sky,
There's not a spot, that's deep or high,
Where our Creator has not trod,
And left the footsteps of a God.

If a planter wish for both profit and pleasure, he must plant a mixture of several sorts of trees, and place them in such a manner, that they neither intercept his view, nor take up his ground (so as to prevent its producing its ordinary course of crops) and that, at the same time, they be agreeable objects, to attract the eye, and enrich his pocket.

The fancy of man in plantations,

(as

(as in most other things) has changed much, within these few years last past.

The taste was, formerly, to plant all in long close rows, at each side of an avenue, or in hedge-rows, or in woods ; but the method is now, to plant in round, square, or angular clumps, in different parts of a domain, at a distance from the mansion-house ; and also to plant odd trees in a scattered manner, up and down lawns and meadows, near the house ; so as not to obstruct any prospect, and yet to make the place look warm and sheltered.

This taste is extremely agreeable to the eye, and also profitable, because the trees are augmenting in size, by feeding under-ground ; and, at the same time, the surface is producing any crop the owner pleases, particularly if he makes choice of such trees as feed deepest in the earth.

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In this case we would have him guard most against ash; it being a tree which, though very useful and profitable, yet is a great impoverisher of the corn-mold, as it feeds near the surface of the earth; neither is it a tree for beauty; as it comes the latest into leaf or season, and goes the soonest out. It should be planted by the sides of high-roads, commons, or such-like waste grounds.

The oak is the best tree that can be planted in a lawn, meadow, or plowed ground; because it feeds deep, and therefore does not impoverish the surface; and, if in ground that is under tillage, the plow can (without obstruction) go near the trunk.

The small-leaved elm is an excellent timber, also a quick grower, and a profitable tree; it ought to be planted in hedge-rows; as it will bear planting closer together than
any

any other tree. It has an aspiring head, and grows best when the boughs are lopped off near the trunk; in this case, it does little damage to any underwood that may be under it.

The following is a list of trees that are proper to be planted intermixedly in lawns, meadows, or pleasure-grounds, viz. oak, English elm, beech, Scotch fir, spruce fir, silver fir, New-England pine, horse-chestnuts, walnut, poplar, sycamore, larches, black-cherry, apple, and white thorn-tree.

These, being properly mixed, will give a diversity of colours and shapes, very agreeable to the spectator, and every one be useful in their turn.

In order to imitate nature, as near as possible, they should be placed very irregular, and likewise so thin, as not to obstruct any prospect, except such as are disagreeable, as a rock, a barren bit of land, or a marl-pit, a quarry, or the like; all such as
these

these should have a clump planted before them, to hide them from the eye.

As to all distant monuments, valleys, woods, rivers, fish-ponds, towns, churches, castles, antique buildings, &c. these are agreeable objects, and ought not to be obstructed from the eye by any home-plantation.

As to the method and time of planting, it varies much; some will recommend Michaelmas-planting for forest-trees, and others the spring.

Trees planted in either season, may do well; but we find by experience, that the best time is, when the sap is rising, viz. from the beginning of March to the end of May.

The month of May is as good a time as any in the year, to plant evergreens in, such as fir, larch, &c. In short, elm trees, and some others, thirty feet high, removed at Midsummer, will thrive well.

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The best way of planting them is, not to dig a hole, as is usual, but to set them upon the top of the ground, and dig a grip round each tree, at about three feet distance; and with the earth that comes out, you must cover up the roots; which will form a little bank or hill round the tree-root; but before you set the tree upon the surface, you must turn the sod (it is to stand on) the grass-side downwards; then the roots will stand upon the fresh mold.

This is not only an easy method, but also a very good one; because the roots feed among the corn-mold; and when the sod rots it turns to manure about the roots, and encourages the growth greatly. If the land be ever so poor in nature, yet they will flourish amain.

Being planted, the next care is to fence them from cattle; for if they be either cropped, or rubbed against, that retards their growth,
and

and makes them runtish. In short, a man had better never plant, if he does not fence from cattle.

But as the expence and trouble of fencing discourages many a one from planting, we shall point out an easy cheap method, to keep the cattle from the trees.

When trees are planted in open pastures, the usual method is, to set three stakes round the tree, in a triangular form, and nail three sticks on the tops of them, and then fasten thorns therein.

The best method is, to tie two bunches of whins (or thorns) round the trunk of the tree, with a thumb-rope made of hay or straw; after which, daub a little cow-dung over each rope; which will prevent them from eating it.

This is a very cheap simple method, and answers the end better than post or rails set round, particularly for all trees that are six feet high

high and upwards; and, indeed none of a less size ought to be transplanted out of the nursery, particularly into lawns, meadows, and such-like open places, where cattle comes. In fencing the trees thus, take care not to put on over-much whins or thorns; five or six pounds weight, if properly placed, with the prickly ends outwards, will answer the end as well as ever so much.

When most sorts of forest-trees are planted, the side-branches ought to be lopped off; but the tap-branch, which is called the leader, must be carefully preserved from any hurt; for, when this is gone, the tree is not worth much. If wind, frost, or any accident, wound or break a leader of a tree, it is the best way immediately to root it up, and replace it with another; as the expence of a tree is a trifle, in comparison of losing two or three years growth,

growth, and the beauty of the tree also.

As to foil proper for trees, we need say little about; as few people in these days but what know that very well; particularly such as rise nurseries, either for their own use, or for public sale.

As to the wetness of the foil, this is immediately provided against by the method of setting the tree upon the surface, and making a grip round it; this puts low wet ground nearly upon the balance of that which is of a drier nature; and whoever tries it, will immediately find the good effects thereof.

CHAP. XII.*How to make a NURSERY, &c.*

AS we would be as concise as possible, without being thought tedious in relating things which are generally known, we shall therefore, in a few words shew the best method of raising a nursery of forest-trees, from such seeds as may easily be procured in the country, by any country-gentleman or farmer.

When you have fixed on the ground for a nursery, as this is seldom of a large extent, we would, by all means, advise trenching it with spades, at least two spits deep; burying the upper spit (wherein are all the roots of grass, weeds, &c.) at
the

the bottom ; this will prevent much of that trouble, that generally attends keeping nurseries clear from weeds, grafs, and fuch-like real enemies to young plants.

The ground being thus trenched, and levelled with a harrow or a garden-rake, your next step is, to determine upon as many sorts of seeds as you would sow, and make so many divisions out, by either stakes, or bits of boughs.

After this, sow your seeds, as intended, upon each division ; then lay out each division in beds nine feet broad, and stretch a garden-line at each side, to guide you straight ; make a small furrow, about a foot broad, and half a foot deep ; and with the mold that comes thereout spread over the ridge, to cover the seed, which will be about one inch thick, and which is a sufficient covering for any sort of seed.

By this method (which is performed

formed with little trouble, being nothing but a shovelling of loose mold to spread over the bed) you save a great deal of seed, to what you would do by harrowing or raking in ; because, in this case, all the seed is covered at an equal depth, and so will come up more even altogether ; and none of it lies exposed to the fowls of the air ; but, if harrowed, the pins let some in very deep, whilst others lie above ground, for birds to carry off.

A very little ground, for a feed-bed, will raise a great number of plants ; but at two, or at most three years old, the plants should be pricked out into another nursery, prepared by trenching, as the feed-beds were. If set in rows, eighteen inches asunder between each row, and one foot in the row distant from each other, they will stand very well, to be eight or ten feet high, before they
need

need to be transplanted out for good and all. They grow up straighter, and have cleaner trunks, for being close together in the second nursery.



CHAP. XIII.

*Explaining the Author's new-invented
moving Sheep-Houses, &c.*

WE have often lamented the miserable condition in which we have seen both sheep and cattle, when eating turnips on the ground in a wet season ; particularly if the land was inclined to clay, or of such a nature as to hold water.

How extremely disagreeable must it be for the poor dumb animals to stand or lie in dirt, perhaps shoe-top deep, which is too often the case.

It is impossible cattle in such a situation can thrive, or feed so well, as were they to lie dry, clean, and warm, neither can they eat the turnips with that freedom and appetite, when

they are rolling or tumbling about in the dirt, as they would out of a clean rack or manger, not to speak of the loss and waste in turnips when in such a dirty condition.

This we believe will be assented to by every reasonable man, and this alone is enough to retard the culture of this valuable crop from spreading or becoming so general as one could wish.

Every one sees the necessity of some contrivance to remedy these evils, but no one ever yet struck out a plausible plan ; some farmers indeed would carry the turnip crop off and eat it upon grass ground, but this is attended with great labour and expence, besides cutting and spoiling the ground, and as the saying is, robbing Peter to pay Paul, as it certainly hurts the turnip ground to carry the crop off.

It was such material considerations as these, which first put us upon

the study if possible to find out a remedy for such evils, and we flatter ourselves that we have accomplished our design, by the invention of a moveable house, which not only answers all the ends of keeping the cattle dry and clean, and of saving the turnips, &c. but is also of a simple construction, and comes cheap to the purchaser, which are very material considerations in any new invention; for the higher the price, and the more complicated the machine is, the lower is its value or utility to the public.

These are the grand points which every inventor ought to keep in view, for though the invention be ever so ingenious, if the construction be such, that none or few but the inventor can work it, or so high in price that the purchase will overbalance the utility arising therefrom, it cannot be said to be profitable: this

is

is the rock that many new inventions split upon.

The top of the house is flat, as it is found by experience that tar will last the longer on, for if it have a fall, in hot weather it would drain off and leave the boards dry; in fact, it would be better to have an inch of water always standing on them, which will preserve the tar for any length of time; therefore, it is best to nail a tileing lath round the edge of the house to keep the water on, and if there be a body of tar under it, even no thicker than a shilling, it will preserve the paper and boards under, neither will it let the water through in any reasonable time.

The sheep-house is sixteen feet and half one way, by six the other; it is all made of deal, has no floor in it, has a rack and manger, the rack is filled with turnips, &c. at the outside of the house.

The staves that the sheep eat

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through

through, stand plum, so consequently, the slope which gives room for the turnips, projects to the out-side of the house.

Under the rack is a manger fixed, which goes close to the bottom, and and only consists of one deal board, six inches broad, one thick, and sixteen feet long, as it goes all the breadth of the house; one of the edges is sloped, or made feather-edged, so as to nail to the bottom of the rack, by this it forms a sort of triangular trough, going narrow at the bottom.

The rack being filled with turnips, any that are large, stick in the top thereof, and as the sheep eat them they grow smaller, so consequently drop lower and lower, till they are small enough to drop through the staves into the manger, which catches every bit, so that none need to be wasted.

The rack-staves are three feet long,

long, and are fixed into the two rails, one for the top, and the other for the bottom of the rack, in order to save a multiplicity of timber. And in order to cut it to the best advantage, buy one plank sixteen feet long by three inches thick, and twelve broad.

This will cut into four scantlings, each about three inches square; these are all that are wanted for the frame of the two ends of the house.

It is to be observed the house is ten feet broader than it is long.

Two of these scantlings are for the fore part of the house, and the other two for the hind part.

The rack and manger are fixed in the end of the house that goes foremost; one of the rails or scantlings are tenoned into a standard at each end, and which, both serves for a platform, the bottom of the rack, and a side or back part of the

manger, because the rack staves go into it.

They are three feet long, and are fixed into the other rail, which is the top of the rack, and also tenoned at each end three feet high into the same standards that the bottom rail is tenoned.

The scantlings for the side of the house are three inches square, and six feet long; there is only one at each side for a platform, and which are tenoned into each end of the sixteen feet and half rails, which go across the house.

The posts or upright standards, which are to support the roof, and to which the boards are nailed round the sides of the house, are only two inches square, and four feet long.

There are five tenoned into the platform, or sixteen feet and a half scantling at the hind part of the house one at each corner, and three at equal distances between.

Between

Between these, are three more, of three feet long, each tenoned at equal distances, into the topmost rail of the rack.

These ten standards, being five before and five behind, are opposite each other, and they must support the roof of the house.

Five spars are joined by mortise and tenon to the top of the said standards, each spar is six feet long, to go the length of the house, and on which, the covering boards are nailed.

At each side of the house are three standards to nail the side boards on, or put netting through, but we think netting round the house is best, except the front, where the manger is; so that the whole number of standards round the house are sixteen, the number of scantlings or rails six, and the number of spars five, which being all joined together as above, form the skeleton of the house, and

what remains is to inclose it with thin boards at three to an inch, or netting as above.

The covering boards must only be nailed in the middle of the board ; this will give them liberty to dry in or expand themselves when wet or dry, without cracking or opening with the sun or wind, whereas, if they were nailed with more nails than one in the breadth of the board, the nails would not give way or yield to the change of weather, therefore there must inevitably be an opening between each nail.

In order to prevent the boards from rising or blowing off with the wind, you must cut a twelve feet inch deal into five rods, almost like tyling laths ; you must stretch one of these across the boards opposite to each spar, and thereto nail them with twelve-penny nails, observing only to put one nail in the middle of each board
close

close by the first nail that fastens the board on.

These laths keep the boards firm and close, and at the same time give them liberty to play and expand themselves backwards and forwards, and yield to the weather as it requires, by which means the boards will never crack or open.

The house runs upon four castors, like those of a bed.

Two of the castors are fixed under the frame at the two hind corners, and the other two are fixed as far distant from them under each of the sides towards the rack, as the rackfull of turnips will weigh it down, so that by once trying what weight of turnips it takes to bring down the said end, for the future you have only to fill the rack till the end come down, and by a piece of chalk, set each rackfull down on the house side; by this you can easily tell what

weight the sheep eat from a day to a month, and so on.

Likewise what weight each acre will produce.

A little trouble and consideration will shew you at what distance from the rack to fix the balancing castors, as they are to act in the nature of a center in a scale beam, and the longest end of the house from these castors is to be equivalent to the weight of turnips put into the rack.

It is necessary to have the said two castors that act as a center for the balance a little higher than the two hindmost castors, in order to make the forepart of the house cock up about six inches from the ground.

The house always stands upon two deal boards, and having two moveable deals, in order to lay before or at the end of these two, you draw the house forward upon them, so by bringing the hindmost forward, you may easily move the houses any
where,

where, for by going behind to push it on, the sheep will naturally fly from you, therefore be no hindrance ; and as the castors always run upon the boards, they are so light a draught that a boy may move them with ease.

By having the moveable boards sixteen feet and a half long, every time they are shifted you measure a square perch of ground, and as there are an hundred and sixty perch in an acre, and as each house will hold twenty sheep, you may bring yourself to a regular mathematical rule to know how much weight of turnips each perch produces, and how long they will serve such a number of sheep.

And all is done without any more trouble than making a chalk every time you move the house, and another chalk each time you fill the rack.

The rack end of the house always
goes

goes forwards towards the standing turnips.

You pull the turnips as far as you can reach, and fill the rack, then push forward the house to a fresh piece; as you pull up the turnips with one hand, you must in the other have a whisp of stiff wheat straw, cut in the nature of a brush, to take off any dirt that may be on the under side of the turnip; this is almost as easily done as let alone, as it keeps the manger clear from dirt.

The labour of taking the turnips by the top, and throwing them into the rack, (having it always beside you) is no more than the present custom of hacking up the shells.

It is to be observed, that sheep are not the better for being kept over close, therefore net work is better than boards to inclose the house round the sides where the manger is not.

No door to let the sheep in is wan-

ted; instead of which, lift up the hind part of the house and prop it with sticks eight feet long, and the sheep will go under, and when in, let it down.

The boards which cover the house must be covered with three sheets of thick strong brown paper; they must be dipped in warm tar, and laid on one above another, crossing the joinings, and over all, pour on tar till it is about the thickness of a shilling.

The above is as concise a description as we can give to make a sheep-house, and there is nothing differs from that of an ox-house, except the height thereof, and the size of the timber.



CHAP. XIV.

Shewing the great utility of the Moving Sheep Houses, were they brought into general use, for all sorts of cattle.

WAS our reader to consider the immense quantities of manure he loses by the present method of housing the cattle, he would let nothing prevent him from making use of moving-houses.

In Germany the farmers make more use of liquid, than any other manure, which experience and their crops tell them that they are right.

They do not lose the least urine from the cattle while they are in the house.

They also convert little house dung into liquid manure, and bring it in casks

casks many miles; they buy it by the gallon at a very high price, and put it together in a pit or reservoir, and keep it ready for use, and esteem it the better for age; they also take care to have close covers to these liquid pits, to prevent the sun from exhaling the spirits therefrom.

Reason proves beyond a contradiction that they are right in all this, and if so, our English farmers would do well to copy from them, and to pay due regard to such manure.

Most sorts of cattle, such as horses, hogs, cows, or sheep, evacuate much more weight by urine than by dung, and the same weight of urine will produce much the greatest quantity of salts, which are, what must feed the crops.

When turnips are eat on the ground with sheep in the moving houses, the land gets all an equal dressing, as the sheep are confined just as long

on

on each part as they are in consuming the crop that grew thereon.

But when at liberty, they, upon every cold blast or shower of rain, run together under a hedge or any little shelter they can find, and remain there till they over manure it, though other parts may want.

Perhaps some of our readers may not consider the thing right, and may imagine that twenty sheep being confined on one perch of ground, may tread it to dirt.

But this is not the case, because they are no longer confined than whilst they eat the turnips that grew thereon, and this they must do, be they confined in what other fencing you please, only with this difference, that they will make more footings by running backwards and forwards to take a bite out of each turnip, than they would do by eating them out of a clean rack and manger.

But what makes dirt in the common

mon way of eating them is, when a fresh break is opened, the sheep immediately traverse it all over, and trample it full of holes, which the first shower of rain fills with water; therefore when the sheep goes again over it, the ground is made immediately into mortar, so consequently the sheep are retarded from feeding, and a great part of the turnips wasted, by being trod and tumbled about in the dirt.

But in the houses this is all prevented, as not the least rain falls upon the ground after the sheep comes on it till they leave it again.

And the ground being whole or untrod when they come upon it, they cannot tread it to dirt, for the more they tread, the dryer and firmer it will be.

They only lie one night on the same ground, neither do they stand half so thick on the ground as they
do

do in the common method of folding.

The turnips being pulled and thrown into the rack, the sheep eats them while they are green, fresh, and retain all their juices; but in the common method, suppose the ground be dry and sandy, yet the shells become dry and lose a great deal of their substance.

Any farmer who contrives to make the best of his crop, will eat the turnip tops with lean sheep, either ewes or hogrils, because they are not of so feeding a nature as the bottoms, being full of a sharp acid quality, which scowers fat sheep, and retards their feeding.

Some farmers in Lincolnshire buy old ewes, and draw out their fore-teeth, and turn them among their turnips to eat the tops, without ever touching the bottoms.

This method, though a barbarous one, shews œconomy, and leaves profit if properly managed.

But

But suppose the stock be too large for the tops to feed them, there may be a loss attending it, as they can eat nothing else to finish the fattening.

Now all this is provided against in the houses, because every second or third house may be allotted for lean sheep, and the tops cut off and given to them.

This may be done with little trouble, by having a scythe point, or the like, fastened in the corner of every house, and a basket placed under it, for the tops to drop into when cut off; and as the houses are all of a row, and close together, they have only a few strides to carry the tops and throw them into the rack to the lean sheep.

A few turnips may be given now and then to the lean sheep for change of diet.

The same œconomy may be used in regard to horned cattle fed with turnips, for the tops may be given
to

to cows, calves, or any sort of lean cattle, and the bottoms to fat cattle, with the like success as in sheep.

If horned cattle be put into houses made the same way, but stronger and higher in proportion to the cattle, they must be tyed to the bottom of the rack by a halter that goes round their horns.

Any cattle or sheep that are fed upon turnips should have a little hay put into the rack every day; in order to clean their mouths, and give them a fresh appetite for turnips.

We see the many and great advantages that attend these houses, in point of turnips; but their utility does not end here; it extends also to grafs ground.

They are very useful for field-stables, or ox-houses; it being much better to have a moveable stable, that can be shifted at pleasure, to a clean and poor part of the field, than, as is usual, to have them stand always in a place
whereto

whereto the cattle resort, and not only break the surface, and tread the ground to mortar, but with their urine enriches it more than needs, whilst other parts want it.

Dung, indeed, may be gathered up, and spread elsewhere; but urine when wastefully dropped cannot be recovered.

We hope to see the time in England, that due regard will be paid to the liquid manure, and that farmers will have no other but moving houses or stables, to expend all their winter fodder in.

Was this the case, they might manure double the quantity of ground with the same number of cattle, and also keep more cattle with the same quantity of fodder too, as none will be wasted, neither need they any litter or bedding, for being moved twice a day, viz. every night and morning on a clean fresh piece of grass,

grafs, they would lie very clean and dry.

What a great piece of grafs ground might a farmer manure in a winter, with ten or a dozen of these houses, going on a breast up a field.

But was this ever to be the case, care must be taken not to spread the dung on the places where the cattle stalled: as that would be rich enough without it.

Each house will manure well, without any other assistance than what went through the body of the cattle, two acres in the winter half-year.

Such houses as are made for winter use, may be converted into hog-houses in summer; and are very valuable to any one who keeps hogs to feed on clover, or any other four grafs; because the hogs can be confined on a place till they eat it bare, and then shifted on to fresh.

By the clover not being trod or
tumbled

tumbled on, it will go the farther; and tho' the hogs are safely confined, (being a mischievius creature) yet they will thrive well.

Besides, there is no one who has cattle in summer pastures, but what has many rank places therein, which produce long four grafs, that the cattle will not eat, and which is the most proper for hogs; therefore if a parcel of hogs be put into one of these houses and the house run over such places, by that means you convert what before was of no use, into real profit.

So that, in short, tho' these houses are cheap and simple, yet their utility may be immense, if brought into general practice.

As carrots and cabbage are excellent winter-feeding, and are likely to gain footing in the world, by ingenious and spirited cultivators, these houses may also be of infinite service in feeding cattle on the ground therewith; as in the case of turnips.

CHAP. XV.

*On the Management of TURNIPS,
and their perfection.*

TURNIPS are a crop that deserves the husbandman's attention, perhaps as much, if not more than any one he can cultivate, particularly for winter-feeding for cattle.

Their general use, as food for cattle, is not of very old standing in England; tho' much more so than cabbage or carrots; but in fact, every vegetable of the sort has made a quick advance within the space of a few years.

If we look back we shall find that not longer than two centuries ago, we had no greens or roots for the table

ble, but what were imported from the Netherlands.

The people in those days imagined the climate of England would not produce garden-stuff; but were they to arise again, and take a view now, they would be surprized at the progress we have made therein; as perhaps we may now go near to rival the world in that point; tho' yet far short of being at the height of improvement, as new discoveries are making every day.

The county of Norfolk is more forward in turnip-husbandry than any other part of England; it is their capital piece of farming, in which they take great pains, and certainly do excel.

Their land is very proper for the crop, being chiefly inclined to sand; therefore the cattle are not abused, nor the turnips wasted in dirt, by feeding off; which is one of the

first considerations belonging to a turnip-crop.

We have seen both clay and loam produce heavier crops of turnips than in Norfolk, and with less labour too; but then the question was, How to eat them off? This is the rock they split upon, as one half perhaps was wasted in the dirt; neither do the cattle thrive so well, or feed so fast in such a disagreeable dirty situation. It is that, which deters farmers from entering heartily into the spirit of the crop; and not so much the want of knowledge how to raise it.

That being simple and easy; as turnips are far from being a tender plant.

But we hope the moving houses will put an end to these difficulties, and that farmers will cultivate this valuable crop on every sort of land, and every part of the kingdom, as there are none but what will produce them, if properly managed.

In

was raised in Ireland, upon strong clay-land, thirty acres of turnips, that upon an average, weighed thirty-nine tons per acre; but some of the best part of the field was weighed, and proved to produce fifty-three tons per acre.

But the land was so clayey and wet, that no cattle could go on it, to eat them; so that they were obliged to carry them off in hampers, on horse-back, which made it very expensive and troublesome, not being then acquainted with the moving sheep-house.

The Norfolk farmers raise all their turnips after fallow; they give three, four, and sometimes five plowings.

They generally dung for turnips; therefore by the fallow, well-dunging, and two or three hand-hoeings, they may well expect a good crop; yet they often lose them by the fly, and sometimes have their land to sow two or three times over.

The best farmers will begin to hoe when the turnips are very young, perhaps not above an inch high.

In this they are certainly right; because if they be suffered to grow thick at first, they draw one another up tall and weak; in which case they get a bad turn in appling; but if thinned early, the tops spread along the ground, and they apple more kindly.

For their first hoeing, their general price is three shillings per acre, and the second two shillings per acre.

When they sell a crop, their medium price is about forty-five shillings per acre; which is but low. But this is chiefly owing to plenty, as every one is in the branch.

Their weight of turnips, per acre from thirty to 40 tons.

The crops vary less in quality than in any other part of the kingdom, owing chiefly to their course of husbandry,

bandry, as every one follows it without varying. And indeed it must be confessed, the Norfolk people are the best turnip-farmers in England, to take them in general.

But the labour of hand-hoeing comes cheaper to them than in any other part of England; owing to the labourers being much accustomed thereto.

A man will hoe half an acre in a day, the second hoeing, with ease; which is a trifling expence, in comparison of what it costs in other parts of the kingdom, where people are entire strangers to that branch.

If land be inclined to weeds, hoeing is absolutely necessary; as it answers the end in a three-fold capacity, viz.

In destroying the weeds, and improving both the land and turnips; and they are great slovens that neglect it, and deserve to be pointed out and laughed at by every one.

There is no land but what will throw up weeds, except trenched land; and though this may do better than any other without hoeing, yet the labour here also would not be thrown away.

The improvement which the land would receive, by stirring and opening the mold, to let the salts of the air there among, and by thinning the turnips, to encourage their growth, would more than doubly pay the expence.

As far as we have tried trenched ground with turnips, (and one may tell by a little matter what would be the case in a great one) it is far preferable to any other tillage; owing to the staple of the ground being deep.

The manure that lies at the bottom thereof encourages the tap-roots to strike downwards, and feed thereamong

Though the body of the turnip
lies

lies above ground, yet it is chiefly fed by the tap-root, which runs perpendicular, to a considerable depth; and the best turnips have generally only one root; and that long and small, with only a few small fibres branching therefrom.

The next observation is, that any tap-rooted plant, (such as carrots, parsnips, or turnips) strikes deeper, and has a better root in the ground that is pretty close and firm, than when the land is too light and open.

In such, they grow forked, having many roots; which is productive of a very bad top.

Every sensible gardener will tread such light ground, when the seeds are sown, to prevent the said evil.

This also shews, that it is alike necessary for a farmer to roll his turnips or carrots, as soon as sown, if the land be light, particularly on trenched-ground; as that will be

more open and light than land that is only plowed one furrow deep.

It is an agreed point, that land for turnips should be well tilled; and that the cleaner it is from weeds, the better.

It is the farmer's interest to sow such land with turnips, as is tired with corn; because it undergoes several operations to improve it.

If stubble-land, it should be plowed as soon as the crop is off, and be well fallowed all winter, and till sowing time, which is about Midsummer following.

But those who chuse to follow the new method of trench-plowing, will save much labour, and be much surer of a crop.

The best method is, to sow part of the crop, on, or as near the twenty-fourth of June as possible, and another part about three weeks or a month after, and when it is likely for rain, and in an evening.

By

By dividing your sowings thus, the crop has not only two chances, but comes in at proper periods, for sheep to be turned therein, to eat it to the best advantage.

The first sown will be ready to turn in about Martinmas; and the last sown may be kept for spring feeding.

If you follow the old husbandry, the quantity of seed per acre is one pound; and, in sowing, take up what stays between one finger and thumb, and chuse a calm evening to sow it in.

Some will cover the seed by bush-harrowing; but it is best to roll it in as soon as sown.

Tho' no manure comes amiss for turnips; yet we never saw better crops than from ashes after burn-beating.

They are fond of ashes in general, but particularly of those burnt from the sod.

However, we do not approve the method; except it be a wild, coarse, deep, rushy, or heathy land.

But where the land has a fine sod, it is bad policy to burn it; because a great deal of the substance of the land flies into the clouds; and let men argue as they will against it, we know both from reason and experience, that it hurts land for the future.

It is a most vile custom, to burn such kindly, fine grass-land, as is burnt in some parts of England; certainly no man would do it, were he to consult reason, and look two or three years before him, and see what would be the consequence.

It is true, he may be sure of a crop by this method; and so might he by a good fallow, which would improve rather than hurt the ground.

If the sod or grass-roots be reduced to manure in the ground, either by fallow or trench-plowing, in such
a case

a case it leaves a lasting substance therein.

But in most sorts of land, when burned, nine-tenths of the substance arise into the firmament; for lay a ton of sods together, and, when burned, they shall be reduced to two hundred weight of ashes.

Let not any man deceive himself, by believing that all the manure stays in the ashes; for that it does not.

There are several sorts of enriching qualities in the earth; but for brevity-sake, we shall only mention two, viz.

Acid salts, and oily salts; the former are of a more ponderous nature than the latter; therefore, while the fire is reducing, or rather separating the grosser particles of the earth from these manures, some of the heaviest salts remain among the ashes.

But the oily salts, which in fact are the richest and smoothest food
for

for plants, evaporate with the smoke.

We may know this by foot ; for one bushel, taken from a chimney, will go as far, for manure, as twenty bushels of ashes taken from the earth ; and yet they are both rarified, or divided from the same fire, and from the same gross materials.

Therefore, let us only conceive what a mistake farmers lie under, who raise manure by fire.

In short, every combustible matter is very full of oily salts ; it is those that make it burn ; and all such matters leave very little substance behind them ; they ascend into the firmament, and are assisting to compose the clouds that we see floating over our heads.

The turnips being sown, the next consideration is, the proper time for hoeing them.

In this, as in most other things, people differ in opinion ; some will

hoe them when very young; some when half-grown, perhaps; and others condemn that practice altogether, and will not hoe at all.

He that hoes them when young, has the advantage of all the rest, because the tops being small, the work is more quickly and safely performed; for, when the leaves are large, and hang over, or cover the ground, it takes up a great deal more time, to look out and divide the best plants; and as they are hid with leaves, except great care be taken, the hoe may reach to, cut, or wound plants one would wish to preserve.

He that will not hoe at all, is still worse, for then he not only lets the turnips smother one another, if sown thick, but permits weeds to grow, to assist in destroying his crop, and also robs his land from a hoeing, which would be of great use to it, let the crop be as it will.

CHAP. XVI.

On different Sorts of Turnip-Seed.

THE following is a list of various sorts of turnip-feed, that are chiefly in cultivation at this present time in England.

First, the large Norfolk sheep-turnip. It stands the winter well, and grows to a good size; the apple or body of the turnip grows all above ground, and has a large top.

Secondly, the early red-top turnip. This also grows large, but does not produce so much weight upon an acre as the first sort; which is owing to its flat shape.

It has a small top, which is of a darkish

darkish green colour, nearly approaching to red.

The upper part of the turnip has a reddish cast, a thin skin, a handsome shape; and it is a sweet-eating turnip, and the surest of all others for a crop.

In short, it is our favourite; but as it is an early turnip, it ought to be eat first; and a proportionable quantity of the Norfolk sort should be sown, and kept for spring-feeding.

Thirdly, the yellow turnip. This is a small sort, and is chiefly cultivated by gardeners for the table.

It is a mild-tasted turnip; and the inside, when boiled, is of a yellowish colour; it may be sown in the field; but its growth is rather dwarfy.

The turnips of both sorts should be sown at, or about, Midsummer, and rolled in, without bush-harrowing.



CHAP. XVII.

On feeding Bullocks with Turnips.

FEEDING bullocks on turnips, is another method practised by some farmers ; but this falls short, in profit, of the sheep-feeding scheme ; except they be consumed on the land, in moving houses ; for though bullocks clear double their first cost, and make as much produce out of an acre, yet the expence is greater in attendance, in the old method ; for, as they are tied in a house, the turnips must be carried to them. Every twenty bullocks will take two houses and two men to attend on them, when thus confined at home.

Again,

Again, the land loses the benefit of the manure, being very considerable, in what it would gain by sheep.

It is true, bullocks make some manure ; but it is very inconsiderable ; as the turnips pass through them chiefly by urine.

The bullocks that are fed by turnips, must never be watered, nor go out of the house, from their first being put in, till they go to the butcher : for the turnips supply them with water enough ; and if they be let at liberty to run or play, it will heat and disturb their bowels ; inso-much that the turnips will pass through them too quick, before they have time to fulfill their office by digestion.

Some farmers manure their meadow lands by feeding sheep upon them with turnips ; but though they gain in one place, they lose in another ; and they also add a multiplicity

plicity of labour and expence thereto, by pulling up and carriage; which they will very sensibly feel in fifteen or twenty acres of turnips: however, every one knows his own situation best. If he be distant from dung for his medows, this method of feeding sheep upon them will give an excellent dressing.

CHAP. XVIII.

On preserving Turnips good for Spring Feeding.

IT has always been a custom among gardeners, when they want to preserve turnips, carrots, parsnips, &c. good for the table in spring, and to keep them from growing, to bury them in dry sand.

Were we to take a cursory view of this method, without entering thoroughly into the merits of the cause, we might think it a very judicious way, and one that might be extended to the preserving of these vegetables good for spring-feeding for cattle.

But,

But, if we look more narrowly into this affair, and withal consult reason, we shall find, that, instead of retarding vegetation by this method, it will forward the growth thereof.

Turnips are full of a juicy substance; and though the sand be ever so dry, when thrown among them, yet they naturally sweat when packed together; therefore they communicate a moisture, which, together with the natural hot quality of the sand, raises a still greater heat; and every one knows that moisture and warmth are two qualities which force vegetation, and the vegetations of such roots is the first thing that helps to render them useless; for being out of the ground, they grow till all the growing quality be exhausted; after which they putrify, and are not fit for food.

However general the practice of burying among sand may be, yet the
above

above are truths and reasons, which must carry conviction along with them, to every reasonable man. But those who doubt it, can easily be convinced upon trial.

The easiest and best method to preserve any sort of roots from vegetation, and so consequently, to keep them longer good for food, and particularly turnips, is, to stack them up in straw.

The method is simple and easy; one load of any sort of dry straw is sufficient to preserve an acre of fifty tons weight of turnips.

Throw the turnips in a sort of a windrow, on the middle of each ridge, then let them lie a few days; and, let what weather will come, they will take no damage.

When you think there are as many pulled, as will make a heap as large as a large haycock, you must then make them up in that form with dry straw.

First,

First, lay a layer of straw next the ground, and upon it a layer of turnips about half a yard thick; then another layer of straw; so go on alternately, laying a layer of straw and a layer of turnips; every layer grows narrower, till it comes to nothing, at top, like a sugar-loaf.

The last layer must be straw, which serves as thatch to keep all dry.

You must observe always, when you have laid a layer of turnips, to stroke, or lap up the ends of the under layer of straw over them, in order to keep them close, or from tumbling out.

You should have in readiness, straw in the field, made in little cocks, where abouts you think the heaps of turnips will be.

When they sweat, the straw, imbibing the wet or watery particles, prevents vegetation.

For want of straw, old stack bottoms,

toms, rushes, or stubble, may answer the end, provided they are dry.

No one, that has turnips, but ought to follow this practice; as every one knows, that, if the weather be mild, they will begin to grow about the latter end of February; after which they grow, every day, worse and worse for feeding.

As the substance grows into the top, it leaves the turnip dry and woody; therefore the sheep or cattle do not like them, and consequently do not feed kindly thereon.



C H A P. XIX.

A Pickle to prevent the Fly from destroying young Turnips, and Smutty Wheat.

UPON looking at the head of this chapter, some of our readers may want faith to believe it; therefore in this, as in other cases, it may not be amiss to give some reasons how the pickle operates, so as to prevent this malady; which few words may explain.

We suppose it would not be hard to make any farmer believe, that, were we to daub every leaf over with brimstone, or such like poisonous obnoxious qualities, it would hinder the fly from preying thereon; but,

but, says he, how is it possible that steeping the seed (though in ever so obnoxious a liquor) can hinder them from preying upon the leaf?

We must consider, that the damage received from the fly, is, when the turnip is in its seed-leaf; the said leaf being soft and tender, the fly feeds thereupon; and the bite thereof is very poisonous to the plant, while in its infant state.

But after it gets out of the seed-leaf, it is safe; because the second leaf is armed or covered with a kind of down or beard, that is so thick-set and pointed, that the fly cannot come near the leaf to feed thereupon; by which means the plant is preserved.

Upon turning to the chapter on smutty wheat, you will see, that, for the very reason why the pickle prevents the worms from preying upon the root, and causing smut in wheat, for the same reason it operates upon

the leaf in turnips, and prevents the fly from preying thereon.

The nature of a grain of wheat and that of a turnip are quite opposite; for the bran or husk of wheat stays in the root in the ground, whereas that of turnip-feed rises and opens into leaf.

In short, the leaf of all oily plants is lapped up in the feed in miniature, and when raised into vegetation, the feed, as it were, unfolds or opens itself all into leaf; this is what is generally called the feed-leaf; and takes the form of a leaf upon it, though it is not lasting; for, as soon as the root begins to feed upon the ground, it throws out another of a harder kind, which, as before observed, is covered with a sort of a down or hair; and then the feed-leaf falls off, or insensibly dies away.

Therefore it is no wonder that the feed-leaf should retain an offensive smell or taste, which strongly affects

these diminutive insects, whose sense of smell and taste are in proportion to their size; and the seed being steeped in a poisonous, nauseous liquor, the leaf, wherein lies their food, retains the said nauseous quality; which they are sensible of, and therefore forbear feeding thereupon.

We do not say that the pickle will kill them, though it is not impossible, should hunger enforce them to feed upon it, which is scarce probable; but as it prevents them from doing damage, it answers the end designed.

However, to be more secure, we would advise always to steep one half of the seed, and to sow the other half unsteeped.

Should the flies be very predominant and hungry, they will feed upon that which was not steeped, till the other has got into the second leaf; and if one half grow, it will do more than feed the ground; for there are

more grains in half an ounce of seed than square feet in an acre, were they properly placed.

If a farmer sows his usual quantity of seed, which is a pound upon an acre, one half steeped in the poisonous pickle, and the other half unsteeped, for the flies to feed upon, he need not fear a crop, be the flies ever so numerous, for the half pound that is pickled will be more than sufficient seed for his land.

Some people will sow half new seed and half old, which is a sensible way ; for the new seed comes up three or four days earlier than the old ; therefore, say they, the flies are feeding upon the new seed, until the old gets into the hairy leaf.

The Receipt.

To every gallon of old chamber-lee, add three ounces of copperas, two quarts of train-oil, half a pint

of

of the oil of turpentine, three ounces of the balsam of sulphur, three ounces of nitre, one quart of bullocks gall, which may be got of the butchers, bruise and squeeze therein a dozen of heads of garlick, add as much foot as you see will make it of a thick ropy substance, in order that as much of the liquor as possible may be left sticking about the grain, that it may gather a thick coat when mixed with the compound powder, which will both add to the manure, and be a preventive against vermin.

When all the above ingredients are mixed, add to the liquor two quarts of bay salt.

The longer all these are mixed before you want them, the better; because they will then have sufficient time to incorporate together, by which means the mild, smooth ingredients will soften or meliorate those of a more harsh, churlish nature; and be in less danger of their

destroying the growing quality of the seed.

In this liquor steep your seed six or eight hours, then take it out, and preserve the pickle for farther use; mix the seed with the following compound of powder, viz.

The compound Manure.

To every peck of ashes, take half a peck of foot, half a peck of lime, and one pound of brimstone in powder, mix all well together, and sift it through a fine sieve, in order to take out all the lumps; spread some of this powder on a table, thin, with a sieve, (which will let through the sort of seed you want to mix), sift some of the seed over it, and mix or rub it with your hands, in order to candy it over with as thick a coat as you possibly can.

It is best only to mix a little at a time, and when it grows too dry, sprinkle

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sprinkle a little liquor over it again, until you enlarge the grains to the size you would wish, the larger the better.

If old, dry wheat be put into pickle, it will retain its growing quality a long time; because the body is so close, hard, and obdurate, that it resists the keen, sharp, and searching particles of the liquor, for a time, and only lets it penetrate by degrees.

Whereas on the other hand, if the grain be soft and full of water, its pores are all open and tender; therefore the sharp particles of the liquor rush in, and seize it all at once, when in this open ungarded state, and may do more hurt to the growing quality in one hour, than they would, in the former case, do in twenty.

The reason that this pickle does not so quickly affect, or destroy the growing quality of seeds, is, because

the sharp, acid and poisonous particles of some of the ingredients are checked, mollified, or let down, by the smooth particles of the oil, which does not destroy the force of those ingredients.

Most people own, that oil is an antidote against poison; and also that, if spirits of turpentine, or such like hot oils, be applied to a horse, for a sprain, or the like, they will fetch off the hair; but mixing them with any sort of oil or grease, will prevent them from having that effect.

In short, numerous hints might be given, to shew, how necessary it is to add oil to pickle, in order to smooth and qualify, and bring it to a proper consistence, that it may not be injurious to the growing quality, was the oil of no other real use; but it certainly is.

The chief object of the aforesaid ingredients being mixed all together, and called a pickle, is, to prevent
flies,

flies, worms, or any thing that is of the nature of these species, from preying upon, or damaging our crops.

Most grubs or worms are the parents of flies ; therefore what is poisonous or obnoxious to the one, must also be offensive to the other.

Now all the ingredients which compose the aforesaid pickle, are, jointly and separately, antidotes against either fly, or grub, or both ; as for instance, rub a horse over with train-oil ; and, so long as the smell remains, a fly will not bite him ; sulphur, foot and chamber-lee, are also their aversion ? and so are lime, salt, turpentine, copperas, rosin, galls, and garlick, antidotes against the worm and grub tribe.

The above liquor is not expensive ; and will abundantly enrich the crop ; particularly if the seed be

well coated over with the compound powder ; therefore we would advise it to be applied to the four following grains, viz. wheat, barley, turnip-feed, and India corn.

CHAP. XX.*General Pickles for Wheat.*

THE following is a general pickle for wheat, to be used by such farmers as sow great quantities, and will not go to the expence of the above pickle and powder, viz.

Take a tar hogshhead ; let it into the ground, with its top even with the surface, in some by-place, having a cover thereon.

In this keep chamber-lee, from one seed time to another ; the older it is, the better : in this throw all the bullock, sheep, hogs, or any sort of galls you can get ; the more the better.

In

In each hogthead full of liquor put two gallons of train-oil, a great many heads of garlick bruised, one pound of copperas, one pound of nitre, and one stone of bay-salt ; steep the seed therein eight hours, and skim off all the light seed that swims at top; then take it out, and, on a floor, mix it with quick lime and foot, of each an equal quantity, till it be of a consistence proper for sowing.

It has always been a maxim for farmers, to sow new wheat ; thinking that old would not grow ; but they may rest assured, that it is rather better than new, and particularly if steeped in this pickle.

And would they come generally into this method, of sowing old wheat, it would save them a great deal of hurry and trouble in threshing out seed wheat in the busy wheat seed time.

But those that sow new wheat, we would advise them to have it as

dry as possible, before they put it into the pickle. If the seed be well candied, no fowls, such as crows, pigeons, &c. will touch it, neither will field-mice eat it.

We might add several other pickles, but since the above answers every good end of enriching the seed, preventing all sorts of vermin, and worms, grubs, flies, &c. from damaging the crop; and as the ingredients are cheap, and may be got in any country-town, we think it would be in vain, to perplex the farmer's ideas with any other.

CHAP. XXI.

*On feeding Cattle, &c. shewing a
cheap Food for laying on Tallow,
never before made public.*

IF our reader has looked over the foregoing chapter, he will the sooner perceive which sort of food will expedite the feeding of his cattle quickest and cheapest; a consideration every one ought to bear in mind.

The quickest feeding a beast can take, is linseed oil and bran mixed.

If the cattle be but small, give each two pecks of bran a day, divided into three feeds; which will serve morning, noon, and night; into
each

each peck put half a pint of linseed oil, mix it well.

The cattle will eat it very greedily; and it feeds them past conception; they must have what hay they will eat, but that will not be much.

The oil dilutes all the rest of the food they eat, and as to itself, it all stays in the beast as fat.

Five gallons of oil, which will only cost about seventeen shillings and six-pence, and the bran in proportion, will fatten a beast sooner and more effectually, than five pounds expended in any other food whatever.

It is well known in Wisbich, Lincolnshire, a gentleman of the faculty in that town, fed a small beast with this food which produced twenty stone five pounds of tallow; and the four quarters only weighed thirty-three stone; such a weight of tallow in so small a beast was prodigiously amazing; we have known it, in a manner,
per-

perform wonders with cattle in fattening them very quick ; but nothing equal to this we have as yet to boast of.

Another method is, to mix two bushels of bran to one bushel of malt dust, and one bushel of pease meal ; when all are mixed well together, and laid in a heap, ready for use, give each beast a peck at a feed, every night and morning, with half a pint of linseed oil, mixed in each feed, just before you give it.

Most stock-masters know that linseed-cakes, from the oil-mills, are good feed for cattle ; yet it is nothing equal in value to the afore-said food ; because there is a richness in the bran, &c. far superior to the husks of the linseed ; for, when the oil is all extracted, the husks are of no use.

Such cattle as are fed upon these cakes, can be said to feed upon nothing but oil, which they contain,
and

and which the mill could not extract.

But admitting that cakes were as good food as oil and bran, (which they are not) yet the food cannot be general; it can only be practised in a very few places, near oil-mills; as it is of too heavy and bulky a nature to admit of distant land-carriage; whereas the oil, bran, &c. can be procured all over the kingdom.

After what has been said, it appears plain, that every sort of food is of value, according to the quantity of oily rich spirits it contains; therefore we would advise every stock-master, or farmer to pay due regard thereto, by providing food of the richest kind, for either his cattle or horses, particularly for such as he intends to feed; if the food be good, less will serve, and the cattle will be handsomer in shape and their bellies will be smaller; a large one looks very disagreeable, either in the horse

or

or cow-kind; and it is chiefly the poorness of the food which causes it.

Keep a horse on hay alone, and he will have a great belly; but give the same horse a proper quantity of corn, and it shall be reduced to a moderate size.

If this was not the case, hunters and running horses would have as big bellies as other cattle; but it is rich feeding which keeps them in proper shape.

The same observations also holds good as to grass-land; therefore, when a farmer wants to take a piece of ground, he should take notice what condition the cattle are in, that go thereon; if their hair be long, rough, and stickling, and their bellies large, he may reasonably conclude the land to be poor and spiritless, the grass it throws up to be destitute of oils or richness, sufficient to satisfy the cravings of appetite, without taking in a great deal of gross matter for that purpose.

On the other hand, if the cattle upon the land be sleek and shining, the hair short and lying close, and the belly round and small, almost like that of a running horse, all these are plain and sure tokens, that the ground on which they go is good, and the grass rich and oily, which evaporates, penetrates, and enriches all the fluids of the body, and keeps them thin, hot, and lively, so consequently the body in health and vigour.



CHAP. XXII.

Experiments made in 1764, by the Author, to find out the true distance, or quantity of Land that Wheat ought to have to grow upon.

IN 1764, the author finished making his machine, that harrows, sows, and rolls at one time; and as it would sow any quantity of grain, on an acre, the broad-cast way, he made a trial in the method of sowing wheat thin; it being his opinion, that a great deal of seed was thrown away by the old method.

However, in some degree, he was disappointed, because it was the first week in February before the machine was finished, therefore out of wheat-feed

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seed time ; but, though late, it was tried with a little.

The middle of a fifteen-acre field was fixed on, which had three different sorts of land in the length of a ridge, and was forty perch long. One end of the field lay low ; the soil was a strong, loamy clay ; the middle was a high hill ; the soil at top was a kind of clay-gravel, very shallow, and mixed with a middle-sized paving stone.

The other end was not so low as the first ; neither was it so strong a clay ; but was what we call a loamy sand : upon the whole, it was very good wheat-earth ; the top of the hill was more proper for barley than wheat.

This field had been much worn by long tillage, and was much inclined to weeds ; the last crop, which was oats, was but indifferent, and full of weeds ; but, in order to recover the land, and kill the weeds,
it

it had been fallowed two years ; in which time it had got seven plowings ; upon the whole, it was in good order, and by far a better fallow than the common run : it got a thin top-dressing, of wet turf-ashes (for he had no other) and harrowed them in with the feed.

Two ridges were very exactly measured ; and, on the fifteenth of February, was sowed fourteen ounces on one ridge ; which, according to the measurement of the ridge, was at the rate of ten pounds to the acre ; on the other ridge was sowed twenty-eight ounces ; which, according to measurement, was at the rate of twenty pounds to the acre.

The ground was very wet ; and the horses sunk as far as the plow went ; however, the feed was not trod in, because it was sown between the harrow and the horses feet ; but the harrow could not come

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over it the second time, without making the ground in mortar; so that it was only harrowed once in a place; therefore more than half the seed lay bare, or uncovered; but as the ground and weather was wet, it soon vegetated, so that, except what the fowls got, it all grew.

Though the machine sowed the grain pretty even, yet, as the land was rough from the plow, it tumbled into holes; and as the earth clogged or stuck to the harrow, it dragged some on heaps. But, however, all this afforded a better opportunity of proving the experiment for a future event. For, if each grain had been placed at a regular distance, they would have lain within about six or seven inches of each other; so that we could not have had an opportunity to know how they would grow at the distance of nine, twelve, eighteen, or twenty inches. But as

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they

they fell by chance, and irregular, it afforded matter for speculation.

About ten days after the seed was sown, it began to shew itself above the ground; from this to the time it had done fooling or branching, we seldom missed a day without a visit to it; so that we closely observed all its stages, situations, or motions.

We measured, and noted every distance we could distinguish any alteration in the plant; and found, that, in general, where a plant had the most room, it made the most shoots from the root, particularly in the good ground, till it came to the distance of about eighteen inches, that is, about nine inches each way. If they stood thinner than this, it made no great difference; because the blades, not being above nine inches long, did not meet with their neighbour, to obstruct each other in spreading.

For

For the nature of a plant of wheat is such, that it grows perpendicular till it is weaned from the kernel, that is, till the flour of the corn has all grown into top and root; for it divides each way, and leaves the chaff or husk in the middle, standing perpendicular at the surface of the earth, resembling a blown egg-shell.

As soon as all the inside or flour is exhausted; so that the blade or top has nothing to depend upon for nourishment but the earth, the two blades open, and fall flat on the ground at the two opposite sides of the root; then, as fast as the root gathers strength, it throws or forces out more plants round it, till it forms a figure like a star, or an open full-blown marygold; and thus the blades keep growing, and creeping along the earth, till they meet with some living obstruction, as grass, weeds, or corn; immediately after which they raise up the points of

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their

their grassy blades, and give over fooling; and what is very extraordinary, though there should be more room at one side of the root than the other, yet they all bear, as it were, harmony, and concur with each other, as if they were sensible of an affront put upon them by an encroaching enemy.

In rich, clean, good, well-tilled land, a plant of wheat may stool to fill eighteen inches square; yet we chose to fix the standard to one foot square in good land; as that will bring forth to maturity, from twenty to thirty ears, which we found to be as many as had sufficient room to grow out of one root; thirty ears to full maturity from one root; but were these thirty ears to have thirty roots, in the same space of land, they certainly would fall down, and what we call root-welt; but if they stood, the ears and grain in them would be small and good for little;

this

this we have accountd for in an other place.

As we observed, the blades of a good fooling-plant fall, spread, and creep along the ground; but if it be crowded when young, it throws up a perpendicular leader or straw, from the middle of the root; and though it be thinned afterwards, yet it never changes the first bad set it gets; but this perpendicular leader takes up all the crown and substance of the root. It is true, upon being thinned, it will throw out more shoots round about; but they will be small, and good for little; and a fooling-root of wheat is not good, except the ears be near of an equal size. Though we had some ears that were only about three inches long; yet most of the good fooling roots had not an ear but what was from five to six inches long; for they were all nearly of one size.

We cut some of the leaders off, from those plants that were likely to be bad stoolers; and we found that this was the remedy to make them stool well; therefore, it is a good thing to turn sheep in, for that purpose, after weeding or thinning; which would make them stool amain. But the best method that could be taken with a crop of wheat, sown in the old or new method, would be, to hoe it.

We had some roots, that produced upwards of fifteen hundred fold, having from twenty to thirty ears at a root; but this was all in the good land, at the lowest end of the field, which was most inclined to clay; the wheat at the other end, that was inclined to a sandy loam, stooled full as well; but the corn in the ears was not so plump or large, neither were the ears so long or well set, but floamy; and the chafes stood
thin

thin and wide ; consequently could not produce, in the same length of ears, so many grains.

As to the middle of the land, which was a high gravelly hill, and a shallow foil, it was hard to find above fifteen stalks or ears from one root ; however, the ears, though not quite so long, yet produced as much real substance as the best ; for they were thick and well set, with a large bold grain.

This was all from the ridge that was sown the thinnest, at the rate of ten pounds to the acre.

As to the ridge which was sown at the rate of twenty pounds to the acre ; it was impossible to find a root with above seventeen ears at it, in the best part of the land, and so in proportion in other parts : this was the most convincing thing of all to the reapers and by-standers, who were all helping to seek ; and they found

more on the thin-fown ridge at thirty ears and upwards to one root, than on the other ridge at seventeen ears to a root.

CHAP. XXIII.

To prevent the rot in Sheep.

THE rot of sheep is very common, and, in some wet seasons and spots of ground, almost general; and though perhaps the malady is of as long standing as the sheep themselves, yet not one of those many authors who have wrote upon this useful creature, has handled this subject properly; that is, so as to point out, by philosophy, the rise and progress of the disorder; and consequently, all must fall short of prescribing a remedy for it.

The long experience the world has had, of the returning wet seasons bringing on this malady, leaves it

beyond a doubt that the rise thereof proceeds from abundance of water; but how this water operates so, as to bring on this malady, is the question.

Many arguments, both verbal and written, have been heard upon the subject; one asserting, that it proceeds from the sheeps taking in, with their food, worm-sprouts, and dirt, which is generally thrown up in great quantities in wet weather.

Others, that it proceeds from the sheeps taking in, with their food, cobwebs, which are always very predominant in wet and warm weather, insomuch, that the grafs is mostly covered with them.

Others assert, in general terms, that rot proceeds from water; but without refining upon the subject sufficiently enough to open our ideas, and prove where a remedy can take place.

The following short lecture will
shew

shew the improbability of the two first problems being the cause of rot; and also prove that water is the cause thereof, and where it takes place; which being fully known, the thing itself points out a cure.

There is no animal of the brute creation, (such as we have in England, or indeed any where else) that will live so long upon dry food, without water, as sheep, rabbits, and hares; neither are there any creatures that are so subject to rot, as these.

A sheep may be reared upon the highest and dryest lands, in the hottest summers, and never desire water; and yet they will drink, if they come where it is; they will also bear a great deal of water, if it be proportionally mixed with salts, as appears by their living and feeding upon turnips, which are a very watery root; but then this is mixed

with a proportionable quantity of salts.

There is likewise no sort of grafs that grows up more quick, or is fuller of water, or juices, than that which grows on salt marshes, on such land as has been either gained from the sea, or where the sea sometimes overflows; yet sheep will never rot upon it.

So far from that, sheep have been often known to knit or recover (which has been tainted aforetime) when put thereon; the reason is, that, though such grafs be full of water, yet it is also full of salts, which by checking the redundancy of the water, prevent its doing of the mischief by rot it otherwise would, and which is generally done by waters that are divested of such salt particles.

Having given these hints, we shall proceed to shew where and how the rot takes place.

The

The word rot, signifies a putrefaction, or a decay of the liver.

The animal body is enlarged in the various sorts of fat, lean, blood, bone, &c. by a vapour or steam, that arises from the maw, and which disperses itself as such, through the whole animal body.

The mouth is to take in food, and the maw is a repository where it remains, till the heat thereof brings on a fermentation ; after which comes a corruption, and then a digestion, which is a separation of particles into the smaller bowels, where there is a still greater degree of heat, which causes a rarefaction ; that is, it rarifies, and separates the most oily rich particles of the food, from those of a more barren nature.

These latter are voided as excrements ; but the former penetrate or evaporate through the skin of the bowels, in a steam or vapour, and are dispersed to different parts of the
body,

body, some as bone, some as fat, some as lean; and others as water or urine into the bladder.

In all evaporating matters, that of the most corroding nature flies off first; and this is what lays on, or feeds the bone; the next degree lays on the lean and the sinews; and that of a more mild, smooth nature, lays on fat.

These, being the richest particles that are impregnated with food, are the first that rise into a steam, are rarified and thinned into very fine particles, and then penetrate through the whole skin of the bowels, and are dispersed through the whole frame of the body, and adhere to each part, according to its nature, as aforesaid.

The next substance, that passes or evaporates through the inclosure of the bowels, is water or urine; and as all food is mixed with a greater quantity of this, than the aforesaid
I refined

refined matter, the discharge is quicker and larger in proportion.

If the food be mixed with a redundancy of water, and be destitute of a proper quantity of salts to digest the water, the animal must suffer thereby.

Because it is the salts that open the pores of the skin, or inclosure of the bowels, and also that of the bladder, and make passages for the water to pass therein.

For there is no visible orifice for such a discharge out of the bowels into any part of the body, from the mouth to the fundament; neither is there any passage, by any visible orifice into the bladder, but through the neck of it; and this is purposely for the discharge or emptying of the bladder, and not for taking in water; for the water enters the bladder through the skin, by an evaporating steam; and it is the salt particles that divide and open the skin of the
blad-

bladder, and make it porous ; which gives admittance to the water.

But should the water be of a poor thin quality, and destitute of a sufficient quantity of salts to keep it alive and active till it enters the bladder, in such case it falls upon the liver, in large drops, and, not having salts thereamong to check it from doing harm, and being in a hot situation, it scalds, as it were, and wounds the liver, under each drop of water, which soon turns to decay.

The point of the liver is generally first affected ; and the reason is, because it lies nearest the maw, from whence this evaporating water proceeds ; it is also of the coldest, deadeft nature ; being farthest from the heat of the blood, which flows more rapidly in those blood-veffels that are more large and plentifully placed in the thick part of the liver, and which are near the heart : and there-

therefore that thick part of the liver has a greater chance to resist, or work off the wounding water; which it does, until it comes in too great abundance for nature to withstand; in such case the sheep cannot long survive it.

The grafs that is impregnated with this poor unspirituous water that rots the sheep, is such as grows in low swampy places, and which perhaps is forced up in one night's time; in wet and warm weather, it springs up so rapidly (mushroom-like) that it has not time to collect the salts of the earth, to bear a part in its composition, but consists chiefly of the rain-water that perhaps fell the night before, and which (as observed in some other parts of this work) had just undergone a rarification, or dividing of the salts from the water, in the firmament.

This frothy grafs may be known by a large drop of water standing at
the

the top of it ; the ſheep eat the ſaid graſs greedily up, and with it ſwallow a great deal of the ſaid water, which being incloſed in the maw, heats, and evaporates into a ſteam, and not having a ſufficiency of ſalts intermixed therewith to perform the office of digeſtion, by opening the different paſſages, as before hinted, likewise to keep the vapour or ſteam alive and active till it enters the bladder ; but we ſay, for want of ſuch a proportionable quantity of ſalts, it falls upon the liver, and rots it as aforeſaid.

It is the rain-water, which has juſt undergone a rarification, or a dividing of the ſalts therefrom, in the firmament, deſcends and is taken up into the body of the ſheep, by means of the aforeſaid frothy graſs ; and then it falls upon the liver, and wounds it.

Admitting that this is the caſe, as it certainly is, a cure, or at leaſt a preventive, ſpeaks for itſelf, namely
falt.

salt. This is what will certainly prevent the rot, if timely applied, without any assistance from other ingredients.

Our method is, when we suspect a rotting season, to give sheep, each, a spoonful of dry salt twice a week. This quantity is sufficient to temper and molify all the food that is taken in : it mixes among the food, in the maw, and evaporates among the watery particles through the body, and prevents their wounding the liver, by giving them a quick passage into the bladder.

By this simple and cheap application, you take away the cause of rot; and the success is not doubtful, but certain; and by frequently using your sheep to it, they will in time, learn to lick the salt, of themselves, if you lay a little upon a flat stone, in several parts of their pasture; they are by nature fond of it; therefore if you once get your flock accustomed

to

to it, the trouble is over, and you need not fear having a rotten sheep on any land, or in any sort of weather.

Let no man despair of success from the above application of salt alone, as it has been proved, both by reason and experience, to be effectual.

Mistake us not, we do not mean that it will cure all; though it is clear the salt will prevent all from rot, if applied; for if the thick part of the liver, that is seated among the blood-vessels and near the heart, be once tainted, you may as well offer to bring the dead to life, as cure such; though at the same time, those which are not above half-rotten may be prevented from going farther; and the liver, as far as is rotten, will knit; so that the sheep will stand feeding the ensuing year.

We do not mean that the farmer can see into his sheep which are curable and which are not; by applying
the

the medicine to all, if he save some, he is well paid, since it is cheap and simple. Many positive people, who can judge no farther by reason than they can see with their eyes, condemn us for pretending to cure the rot in sheep, a thing they think impossible; on such our labour is lost; and they have no advantage, because their faith will not let them try the medicine.

Others may apply the medicine; and some of their flock may be too far gone for cure, therefore die; the farmer sees this with his eyes, he knows he applied the medicine to these sheep; he sees them dead, and upon opening them, he finds them rotten.

Here again we suffer in his opinion, for the sheep that live he immediately concludes were not rotten, so no thanks to the medicine for their cure.

We once were present at a table, in Lincolnshire, where sat about
twenty-

twenty-five farmers, most of whom lived near the sea side, where their sheep went upon salt-marshes.

There were some others that came out of the rotten-sheep country, and were then at a fair, buying sheep, to replace their stock, that were gone off by the rot.

So that the discourse naturally turned upon the subject of rotten sheep, with their cures, land, &c.

There were various opinions on the subject.

It happened that there was one man in company, who had saved his sheep from the rot, by giving them salt, which he advanced as a truth; but it was looked upon as a chimerical story, by those who came out of the rotten country.

In short, it was agreed by all the salt-marsh farmers present, that sheep will not rot on a salt-marsh; that it is rather a remedy for the disorder, if not too far gone.

Salt

Salt is a very wholesome thing for all sorts of cattle, it not only keeps them cool and open in their bodies, by giving a quick and regular digestion to their food, but it is an antidote against grubs and worms, and also a preservative against every disorder or infection.

It would be well done of every farmer or stock-master, to give their cattle a handful of dry salt every now and then, or to learn them to lick it off stones; which they soon will do, with a little trouble, if placed up and down their pastures.

CHAP. XXIV.

*A few Remarks made in the West of
England.*

BEING glad both to give and receive any instructions that may be of utility to the public, for the improvement of agriculture, when upon our travels, we wait upon such gentlemen-farmers as are best able to satisfy our curiosity, and take advice.

And as we are well convinced of the great advantage that would accrue, not only to the husbandman, but also to the public in general, could the farmers be prevailed upon to put in practice trench plowing, and setting the seed regularly.

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We generally introduce those subjects, and are as often answered, that setting the seed grain by grain, would be too tedious and expensive; and as to trench-plowing, their land will not bear it.

We have sometimes started this subject among a company of farmers; and have had the satisfaction to find some of them quote circumstances to back our arguments; two or three of which are as follows:

Mr. William Lacy, of Ropley, in Hampshire, said that he had a piece of thin chalky land, which, a few years ago, he plowed in a very dry time; his orders, to the plowmen, were to plow it as usual, perhaps not above two or three inches deep, for fear of coming too near the chalk, which would spoil the land.

However, as the ground was extremely hard and dry, the men could not obey their master's orders; for,

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instead of three inches, the earth broke up from the bed of chalk, and turned up in large furrows, perhaps a foot thick.

The farmer, as well as his neighbours, thought the land was spoiled for ever; but, contrary to his expectations, he never had so good crops on that ground before, as he had both that year and since.

The like case happened to one Farmer Baker, not far from Warminster, Wilts. For though the land broke up from the chalk, yet it brought better crops after this deep plowing than before.

A gentleman-farmer, near Froome, in Somersetshire, plowed a piece of strong clay land, in a dry time. His intention was to plow it thin; for as it had a white clay under the corn-mold, he was afraid to turn it up, least it should spoil the ground. But, contrary to his desire, the ground rose in large thick furrows,
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and

and brought up much clay with it. However, the clay melted with the sun in summer, and the frost in winter ; and both the ground, with the crops upon it, have been much better since, than before.

Mr. Davis of Frampton, in Dorsetshire, a very worthy gentleman-farmer, plowed a piece of downland, much deeper than common, and his crops were a great deal better for it. The particulars of this experiment are forgot, but well remember the substance, as it caused a laugh in the company at dinner.

We, as usual, was extolling trench-plowing, but Mr. Davis was not without a great many doubts and fears that his land would not bear it. However, in the midst of his scruples, he recollected the above case, which had happened to himself.

Mr. Ingram of Clarendon-park, near Salisbury, Wilts. rents a down farm. He has a large field near his

house, which he fallowed. The ground was very full of weeds and scutch-grass, and he had taken a great deal of pains to destroy them, by plowing, and harrowing it many times over. At that time he was burning the weeds, and such rubbish as was harrowed up.

He was told he might have improved the land much better, and with a great deal less expence, if he had trench-plowed it, for by that means all the substance of the weeds would have remained in the ground, and turned into a rich manure; whereas by burning them, such enriching qualities are evaporated.

In short, it was explained to him the whole method and value of trench-plowing, which he seemed to listen to with attention, but was not without his doubts and fears, that the ground would not bear it; however, those doubts were soon removed, by trying the ground with a spade.

a spade. But what strengthened the argument the more, was a garden which had been inclosed from the said field. He said, that for some years after the garden was inclosed, it produced very bad crops. Every thing that grew in it was small and runtish ; neither could the ground be kept free from weeds. A gardener told him, as a great secret, that if he would have good crops, he must trench to the depth of three spade-grafts deep, and throw to the bottom all the upper mold which contained the weeds. He did so, and ever since it has been the best garden in the country.

When he considered well the whole affair, he liked the scheme ; and immediately got a plow made according to directions ; and as wheat-feed time was then coming on, he trench-plowed the land on which he sowed his wheat. He allowed to each acre only, about

half the quantity of seed that is commonly used. And, at that time, there was not a crop in the neighbouring county that looked so well as his, which was then March.

Many farmers, hearing of his proceedings, came to see his trenched land and crop; and every one approved of it; and that he knew a great many who were then getting trench-plows made from his pattern, and that he was sure it would gain ground amazingly. Thus he specified the last time we saw him.

Mr. Hardy, of Martin's-town, Dorset, is a very considerable gentleman-farmer, and seems to be indued with talents and a spirit for improvement. He was shewn how to alter his plow, for the purpose of trench-plowing.

Mr. Thomas Nicholls, of Burton, Dorset, is a considerable gentleman-farmer; and one that seems to excel in husbandry. He was so much bent
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upon this method of trench-plowing, that he offered our plowman thirty pounds a year; which, by the by, we did not thank him for, as it has made the man faucy ever since.

William Helyar, Esq; of Coker, in Somersetsshire, a gentleman fond of improvements, is also determined to begin the method of trench-plowing.

Upon looking over the memorandum book, we found no less than two hundred and twenty-nine, to whom we have shewed how to alter the plows for trench-plowing; and who said, they would absolutely put it in practice.



CHAP. XXV.

On thin Sowing, &c.

AS in the last chapter is given some favourable hints upon deep plowing, gathered from several counties; this chapter, in like manner, will prove the value of thin sowing, which particularly deserves the farmer's attention.

A tradesman in Gloucester, has one acre of land, which lies within the turnpike. The same has been some time occupied as a garden; but it being overruin with weeds, he was advised to sow it with wheat, and lay it down with grass-seeds, which accordingly he did; but contrary to
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the common method; for he bought a peck of wheat, and after the land was properly tilled, hired two women to set it grain by grain, with setting sticks.

They used only seven pints of the seed, and finished the acre in thirteen hours.

They had orders to make each hole nine inches asunder, and in each to drop one grain of corn. However, as they had no regular rule to go by, they might err in the distance, and also sometimes, put more grains than one in a hole.

The seed was set in February, and the land hoed in April, to keep down the weeds, which sprung up very plentifully. Clover seed was sown immediately after.

In July, the crop was remarkably good; but had it been kept clear from weeds, the clover would have been much better, as it was much crowded.

The straw was at least six feet long; the ears, in general, about six inches long, and contained, upon an average, about eighty grains each.

Several hours were spent in counting how many ears sprung from a root, which varied, all the way, from fifteen to thirty. So that, upon a medium, each root through the acre, taking one with another, produced twenty ears.

It was believed, by all judges in corn, that the acre would produce, at least, fifty Winchester bushels.

The Rev. Mr. Sandys, Rector of Yeovilton, Somersetshire, set a piece of ground (in quantity about an acre and a half) with wheat, grain by grain, in the same manner as they dibble beans. It took a peck and a half of seed; the labour cost half a guinea. The produce was eighty bushels of clean corn, Winchester measure.

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A gentleman, in Warwickshire, set four acres also, grain by grain.

The seed it took was three pecks and a half. The labour cost seventeen shillings and six-pence. The produce was two hundred and two bushels of clean corn, Winchester measure.

A gentleman, near Newcastle-upon-Tyne, set some naked or Siberian wheat, one foot asunder each grain; it produced about two thousand fold.

In short, were we to insert all the experiments of the sort, which have come to our knowledge, they would fill a volume: neither is there any necessity for it; as every sensible man will admit, that, if an experiment will stand good for one acre, it will for any greater quantity.

It is only enlarging the scale, and keeping up to the rules; and fear not but that the produce will be the same in proportion.

Would all the farmers in the kingdom, come into this saving method, of setting the seed, it would be one step towards reducing the price of provisions; as it would save annually, at least, a million quarters of corn; which, by the present method, is thrown away, and lost to all intents and purposes.

The money that would be paid for labour, to make this saving, would go in a direct channel to such of the women and children as would otherwise be idle.

CHAP. XXVI.

To improve Ground, destroy Whins and Broom, and, at the same time, raise a valuable Crop of Potatoes.

AS much land as there lies, in a manner, waste, through his Majesty's dominions, by being overrun with whins, we have not as yet seen any method found out to eradicate them, but by strength of men and money; however, what is to follow, may shew the great treasure that may be made of them, by those, who, perhaps, formerly thought them a nuisance, and, with great expence, have strove to be quit of them.

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Some burn the tops on the ground and stub up the roots by men, at great expence; others (who think themselves, perhaps, at the height of improvement in this matter) tear them up with strong plows and horses. But, if they consider what a vast body of manure they send into the clouds, and destroy, they certainly would be angry with themselves for so doing.

Particularly, when they once try the valuable method of setting potatoes on them; they will then see, that the sap they contain is a very rich manure, which, when, smothered, quickly rots: it will enrich the ground past imagination, and, at the same time, raise a valuable crop, with very little expence.

The second crop (for it will bring two) will not be much inferior to the first; and it may be got with very small trouble or expence.

After the second crop of potatoes

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is off, if the ground be strong, it will bring a good crop of wheat or beans; or if light and sandy, barley or ye.

The first thing that is to be done, is, to cut away through the whins, where the trenches will fall, then stretch a line to the breadth of the ridge you fix upon; if your ground be a deep good soil, the ridge may be broad, and the trench so deep, as to afford earth enough to cover the whins four inches thick.

The most general breadth of these beds or ridges, is nine feet; and the trench or furrow, two feet: so that two spits deep and a shovelling, will give the covering required.

Tread down the whins, before you lay on the earth, so as to make them fall close one way; if they be not very strong stalks, treading and the earth will keep them down; but if the stalks be too gross, give them a nick close to the root. All the whins you cut up, where the furrow falls,
you

you must lay on the ridge, in the most vacant places you can find; as there are few closes so full of whins but have some bare spots; therefore what is cut from the furrow will make up the deficiency of manure; as they will now act in that station.

But it matters not how strong or rank the whins are on the ground: if they be six feet high in one continued bed, the better, and the more manure it will afford your land.

There is no method yet found out for destroying whins, equal to this; as to fallow, they often grow after, in spots; but they are effectually smothered, when properly done thus.

The longer the ground is trenched before the potatoes are set, the better; that the whins may have time to rot and ferment with the earth, they should be trenched under, about

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Michaelmas, and the potatoes set in April following.

Holes must be made, nine inches asunder, with a setting-stick, to let the seed down to the whins. In order to make the stick sink the easier, fix a pin across, six inches from the bottom, to set the foot upon, in the nature of a spade.

And as you make the holes, any children will follow, and drop in the seed.

After they are set, rake the land over, to fill the holes.

When the potatoes are just beginning to peep above ground, shovel the furrows, and throw the loose earth over the bed; which will give it a thin covering; all the loose earth that the spade leaves in trenching, must be reserved at the bottom of the furrow, on purpose for this use.

When you dig out the potatoes, gather them as clean as you can;
there

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there will still be sufficient seed left in the ground for a second crop; do not raise any of the whin-stalks; but leave them in the ground.

When the potatoes are up, shovel the trenches, and leave the ridge smooth, and covered up all winter.

If there be not a very hard frost, you will get a second crop, without any more expence; but if the frost be so hard, as to rot the sets in the ground, all you have to do, is, to set them over again in the spring; and after they are set, rake, and fill the holes, as you did the first year.

It is by far the best, to take two crops; because the second is got for little expence; and it gives a sufficient time for the whins to rot, and the earth to meliorate.

The stalks and roots of the whins will be so rotten, as not to resist the plow; therefore you may plow up the second crop of potatoes, and till the ground, either for wheat or barley;

ley; which cannot fail of a crop, after such a rich dressing.

This is an excellent method to improve common land that is covered with whins, should there be a general inclosure, which is now in agitation.

What whin stalks remain undecayed may be gathered up after the plough.

CHAP. XXVII.

*A compound Manure to improve Land,
and also to prevent the Red or Cut-
Worm, and the Slug from destroying
Green Corn, &c.*

IF our pickles for wheat or turnip-feed be duly attended to, and the grain candied with a thick coat of manure, it will be a great means to prevent any insect of the worm, grub, or Slug-tribe, from preying upon the crop, for it is so extremely offensive to them, that they do not care to stay in the root where it is; except the land be very full of them, and other food, such as weeds, grass, &c. be scarce; in such cases, hunger may
force

force them to eat what they did not like; therefore we shall propose other remedies, that will more immediately fall upon their food, and prevent them from eating thereon; but shall first give a description of the grub that does the most damage to corn in its green state.

The cut-worm, or by some called the red worm, is of the grub or maggot-kind; it is about three quarters of an inch long, and is about the eighth of an inch in diameter; the body is of a pale yellow colour; but its head is almost black, or of a deep red; it has a sort of feet, but, by nature, is extremely helpless as to motion or movement; one can scarce ever see it creep; if a plow or spade throw it above ground, it is long before it can get itself again covered with mold.

Therefore if land be often turned up with plow, harrow, or other instruments, these worms are quickly

destroyed by the fowls of the air, when exposed thereto.

Their food lies in the roots of grafs, corn, or other vegetables, which are soft and juicy, the greatest damage they do to green corn is, from about the beginning of April to the latter end of May.

They cut the corn off, as if cut by a knife, about an inch within the surface of the earth, so that the corn dies away, and the crop is entirely lost.

We have seen a close, containing twenty acres of wheat, which was a fine crop, the latter end of April, but by the latter end of May was all destroyed, so that the land was obliged to be plowed up in June.

In short, they are a very destructive creature; we have tried many experiments to prevent the crop from being destroyed by them; but found none so effectual as the compound manure as follows, viz.

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To every ten bushels of foot, mix ten bushels of any sort of dry ashes, ten bushels of unflecked lime, and ten stone of bay-salt.

Take out of the hoghead five gallons of the pickle for wheat, and add to it five quarts of galls, which you will get at the butchers for eight-pence a quart, and five gallons of train-oil; mix these together, having all the above articles ready provided in some out building, (for they must be kept dry) have three or four persons to mix them.

First, spread on the floor a layer of ashes, then a layer of lime, then a layer of foot, then a layer of salt; a person, all this time, must be sprinkling, on the liquor, in order to mix every thing as even as possible together.

Being thus mixed, be provided either with a cart-load of dry ashes,
or,

or, for want of these, a cart-load of fine dry-mold out of a fallow field, with which the compound must be close covered, in order to keep in the steam or vapour, which will naturally arise from the heat of the lime when flecking, and the rest of the compound fermenting together.

When thus mixed and covered up close, let it lie three or four days, or longer, if you do not want it; in this time, the lime will be flecked and fallen to powder, and the heat thereof will dry up the liquor; so that when the compound is turned, and well mixed, it will be a dry powder.

In turning and mixing the compound, you must mix along with it the ashes or dry mold that covered up the heap; when thus mixed, let it lie a few days longer, in order to incorporate together, as the longer it is made before it is wanted, the better; for it improves by age.

Chuse a calm dewy morning, or
even-

evening, to sow it in; the dust falls upon the blades of the corn, and being wet, it sticks thereto, and the next rain or dew that comes washes it down the stalks to the root; the nauseous poisonous quality of which prevents the grubs or worms from feeding thereon; and also being a rich manure, it encourages the growth of the corn amazingly.

CHAP. XXVIII.

Directions for keeping Horses dry and clean without Litter, as in America.

THIS may seem strange to an English reader, however, it is very common in America for horses to stand and lie upon stages made of boards, without litter. Indeed at the first glance it may seem an uncouth, hard-hearted method; but a very little philosophy will shew the utility to any rational thinking man. The chief objection that can be made against it, is the hardness of the bed;—but a hard, smooth, even bed is much easier than a hard lumpy one,

one, as must be the case when on the pavement, if not well littered; besides, nature never intended that cattle should have beds, if we leave them in the fields from their births to their deaths, they would never take cold, or be so subject to disorders, while kept in their accustomed elements, it is the change of the climate, by way of keeping them in different situations that perverts nature and brings on diseases.

In some stables horses are kept littered up to their bellies all night; this heats their legs and causes the fluids to circulate downwards; at other times the litter is thrown under the manger, and the creature stands from morning till night on a cold wet pavement, and being sometimes accustomed to litter, they will not lie down till it is thrown under them. It is also well known that nothing will sooner give

a horse greafe than long ftanding, a good lying one feldom has this diforder.

A horfe that always ftands on a clean, even, dry boarded floor, knows no change, neither does he look for any other bed; he will lie when nature requires it, he has not the cold wet pavement to lie on for ten or twelve hours together, and then littered to heat his legs. Whereas, this is all avoided by the ftage, for on it he is always kept clean and dry, and in one temperature.

In Philadelphia no litter is made ufe of, the horfes ftand on boarded ftages, and cattle are clean and bright, one is fcarce ever feen with a wet dirty hip. In fhort, reafon and experience for feveral years together, both in America, and fince our arrival in Europe, has fo thoroughly convinced us of the utility, that were we to have ftraw
for

for nothing, we would prefer a boarded stage in our own stables, but in the case of travelling, we must submit to the customs of the country.

CHAP. XXIX.

Directions how to make the stage.

THE Stage must only extend twelve inches farther back than where the horses hind-feet stands, when he is eating at the rack by which the dung, when it drops, will in general fall off the stage; but should any drop by chance on the edge of the boards, it is soon swept off.

The joists on which the boards are nailed, must be three inches thick, and four deep, and be laid on the pavement within a foot of each other, the boards must be an inch thick, and plained on the upper side but not close jointed, leaving them rather open to let the water through

as

it falls, without spreading over the stage; by which it is soon dry. It is best to part the stables into stalls, to prevent the horses from turning round to dirty the stages, where they ought not.

Thus a stage may be made at a trifling expence, and may be laid over an earthen floor if necessary, with a small drain to carry off the water.

CHAP. XXX.

On raising Tobacco.

THIS is a profitable crop, easily managed, and in the climate and lands of England, may be brought to as great perfection as in North America.

It is true there is an act subsisting which prohibits sowing any great quantity in England. However, since we lost America, it is little notice taken of, before that time, it was strictly observed to be kept under in England, in order to encourage our own plantations in America.

It is amazing what an immense quantity is destroyed in England and Scotland, by smoking, chewing, and

and snuff, particularly among the lower class of people, for the quality in general have left it off, or at least prevent their offspring from making use of it.

The lower people in Ireland and Scotland are generally infatuated to it, they would almost as soon want a meal's meat, as tobacco, and would much rather go barefoot than be without it; we are confident many in those countries that go without shoes and stockings, destroy more money in tobacco than would keep them in these articles; in short, it is a foolish, dirty, unmeaning custom, which ought to be abolished by every person of sense, having no good quality attending it; for though it has its perfections as a medicine in some diseases, yet they are all lost to those who make a common use of it, for by general practice any effects as a medicine, is entirely done away.

Any one who has even a small garden, may, at little expence or trouble, raise what would serve a family, the seed being very small, an ounce will produce more plants than will stock an acre.

The seed must be sown on a cucumber-bed, about the middle of March, and when it has grown into two leaves, about three inches high, prick out the plants into beds at six inches a-part from each other, and in about a month's time, they may be removed into rows, each plant two feet asunder, and the rows at three feet distance from each other, cut up the weeds with a hoe, and draw the mold to the stems of the plants at different periods, as you see necessity requires to kill the weeds.

Some of the outside leaves will be ripe before the rest of the crop, which may be known by the edge of the said leaves turning yellow, those must be stripped off and hung up in
a barn,

a barn, or under any cover, so as to keep them from rain, tie three or four leaves together by the thick end with a string; these are called hands; hang them upon nails, or a-crofs ropes or rails to dry.

When the plants begin to bud for feeding, go among them and nip the buds off between your thumb and finger, all, except what you intend to stand for seed, this will make them strike more into leaf, and the leaves will grow longer and broader, which is the greatest perfection in tobacco.

The crop is all ripe for gathering when the ribs of leaves nearest the seed (which keep the longest green) will bend or double close together without breaking, then you may fall to work, strip the leaves from the stalks and tie them in hands as above observed, three or four together, and hang them to dry, but take care they hang loose and open.

They must also be looked amongst and turned often, or they will mould, rot, and spoil, which is often the case in great quantities, if pinched for room where it is scarce.

In America they have tobacco houses that are large buildings like barns, they hang the tobacco on nails, ropes, &c. and make a fire on the middle of the floor to dry it, particularly if the weather be wet and hazy, which often happens about tobacco harvest.

When the leaves are first stripped from the stalks, in the fields, lay them in rows, and let them remain two or three days in the sun to whither, taking care to turn them every day, or the under side will mould, after which make them in hands for hanging to dry.

When dry, lay them in beds four or five feet high, and the breadth the leaves take in length; this is to give them a sweat; but care must be taken not to let it turn to a white mould;

to

to prevent this, the beds must be turned or made over again, beginning at the upper row, and lay them on the ground, hand by hand, and thus it must be turned as often as wanted till it becomes dry and of a brown colour, after which it must be packed very close in hogheads for use.

There are several sorts of tobacco, some grow small or dwarfy, the plants not above three feet high ; there are others that will grow to be six or seven feet high ; and the largest leaves eighteen inches or two feet long. Oronoco seed is the most proper for the English climate. When the seed is properly ripe, it will as easily thrash out as mustard seed.



CHAP. XXXI.

On the Advantage of Dibbling Wheat.

*Being an Extract of a Letter from Mr.
Charles Varlo to Lord Viscount Cre-
morne, dated London, 21st June,
1794.*

MY LORD,

I FLATTER myself you will be so kind as to lay before the Board of Agriculture, of which you are a member, one of the most valuable improvements that, perhaps, ever appeared in that science, viz.

The method of setting corn, grain by grain, as at present practised by a great number of farmers in Norfolk, and which would become general in the three kingdoms, were it publicly known to be of the utility it really is.

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As I was the first that proved its value, both by theory and practice, it gives me great pleasure to see the method answer my most sanguine expectations, and overcome the prejudices that were first raised against it. I make no doubt, but were this method to become general, that one-third more corn would be produced, than is by the present mode of random sowing, besides other advantages that would accrue both to the farmer and labouring poor.

This is no chimerical scheme, but real facts, which I shall literally and simply show as they happened:—viz.

In 1764 I tried the experiment, and inserted the result in my Yorkshire-Farmer, published in the second year, and have since continued the directions of management in all my editions, both of the New System of Husbandry, and Essence of Agriculture.

Agriculture, which were circulated in England, Ireland, and America.

In considering the works of nature, through all the vegetable creation, and comparing them with the farmer's practice of sowing I found many defects in the latter, which cramped the former from producing her abundance, but in nothing more than in that of seeding the ground, as, in most cases, three-fourths of the seed is thrown away by the present mode of random sowing.

Mr. Tull, and many other authors, had the same idea, which induced them to invent drill-ploughs, in order to reduce it to some sort of a regular system by drilling—but, with all their efforts it never could be made general.

When I came to consider the whole process, I found that even drilling was only half doing the business, as air, which keep the crop in health and vigour, can
only

circulate two ways ; I therefore caused a machine to be made, to place the corn regularly in a diagonal form, it was finished in 1764, for which the Honourable Dublin Society voted me a premium.

With this machine I proved the proper distances that the grain should stand from each other, in order to give nature liberty to produce her full increase, but in these I found there is no general rule without an exception, but that circumstances must vary according to the soil, which, if of a deep and rich quality, and kept clear from weeds, one grain, set in the middle of a circular foot diameter, will stool to fill the space—but if the soil be of a weak, sandy, or gravelly nature, a grain would only fill about six inches diameter ; however, this is supposing every grain to happen nothing, but to come to maturity, which is too great a hazard to trust to ; therefore,

fore, experience has taught, that two, three, or even four grains in a hole are necessary, and may be productive of a sure crop.

When a grain of corn vegetates, it appears with two blades sticking together, till about three inches high, then it parts and falls flat on the ground, to each side of the root; at that period, it is what we call weaned from the kernel, and then begins to take its nutriment from the earth, whereas, the first two blades are, in fact, no more than the kernel or flower of the seed, turned into a green leaf; when this springs up, it leaves in the ground the husks or bran, which may be said to resemble a blown egg, and these will remain, undecayed, even till after the corn is reaped. By thus observing minutely the progress of the plant, through all its stages, led me to find out the cause and preventive of smutty wheat, a malady well known among the

the farmers to be the destruction of many a good crop; having hit upon the cause, it was easy to find out an effectual cure, which I have done, is well known to numbers that have read my works, and I believe, I may say, I was the first author that so minutely and so largely treated on the subject, through all its stages of growth, from the seed to the sickle—but to return to the setting: the seed plant which springs from the kernel, generally produces the stoutest straw, largest ear, and boldest grain, though indeed, all the succeeding shoots which spring from the sides, may be good, yet, in general, they are not, but abate something of the size of the ear and number of the grain of the first shoot.

Nature is very prolific, and will not fail of filling the ground, so long as she can find food to feed the plants. The ear in the middle, which fills the kernel, will be the largest, and,
if

if good land, perhaps, contain, from 90 to 100 grains; the next ears may abate something of the number, and so on till they become very small, perhaps, only a few grains in an ear; but, were any of these branches flipt off while young, and transplanted, they would strike root and produce ears of a full size, according to the room given for the root to spread: this shews the true policy of putting a proper number of grains into each hole, two, three, or at most, four, is very sufficient to produce a full crop—more would starve the cause, by eating one another out; four dropped in a hole of an inch diameter, (which is generally the size of a setting stick) would have an outside to give them liberty to feed round, and the ear, being the produce of the flower, as before observed, would be strong, and the straw stout to support it; whereas, should five, six, seven, or more, be dropped in the
same

same hole, (and which is too often the case) they would draw each other up to be weak and dwindling, the inside plants would suffer both for the want of food and air.

I have seen so many experiments of the sort tried, that I am confident none can equal the method of setting corn at a proper distance, as before described, in order to produce a full crop.

Another great benefit that arises from the corn being set at an equal distance from each other is, that it can be quickly hoed, an operation very necessary to kill the weeds, lighten the ground, and give vigour to the plants, and is a business that may be performed by women, boys, or girls, as the space between root and root is not to seek, being at a regular distance.

When my work made its appearance

ance first among the Norfolk farmers, (which are some of the best in the kingdom) it was looked upon as a foolish chimerical scheme, and not likely to answer the purpose, within any reasonable degree of expence, except it could be performed by a machine, such as spike-rollers, &c. and, indeed, though I was well convinced of its utility, by the eye of reason, yet I was rather doubtful, that if it failed, this is the rock it would split upon; however, experience soon proved the reverse.

It is true, I found out the first principle by my machine, as is before specified; but repeated trials shewed, that no complicated machine was equal to setting by hand.

About five years after my work circulated in Norfolk, business brought me to that county, and in an open field about three miles from Norwich, I was agreeably surprized to see several companies at work, set-

ting wheat—this happened about twenty-five years since: I never heard any thing more of it till the present year, that I came to Lynn in Norfolk, where I went to the Crown inn with a company of gentlemen farmers, who mostly followed that practice, and who all agreed, that it was a very valuable discovery, both to the farmers and the poor.

Having so good an opportunity of taking the sense of so many respectable farmers as were present, I begged to know the particular advantage that accrued from this mode of setting, above all others they formerly practised, and if they were willing I should report it to the honourable Board of Agriculture, or the Royal society, in order that if the members of the said board thought proper, they might insert it in the public papers, for the good of the community in general; they severally answered, they had no objection how public it

was

was made, for it was well worthy of being communicated. I requested to know what the increase might be by setting, and the other advantages? To these questions I was answered as follows:—First, that the produce was more, by ten or twelve bushels an acre, than by the former method, particularly if the set wheat is hoed. Secondly, it is less liable to misfortune, such as lodging, after heavy rains, mildews, &c. Thirdly, the straw is stouter and the grain bolder, consequently would give the best price. Fourthly, employing so many poor children, parish rates would be less.

As to the quantity of wheat that might be set in the season, it may be judged of by the gentlemen, whose names are herein after specified, which was given in writing by Mr. George Barber, one of the company, viz.

ACRES.

Mr. John Barber, of Luntun, Norfolk, set 200
Benjamin

Benjamin Barber, Woodbastwick, Do.	—	140
George Barber, Stanninghall, Do.	—	100
Thomas Brown, Thrigby, Do.	—	70
George Everit, Caister, Do.	—	60
John Christmas, Billockby, Do.	—	100
James Burroughes, Esq. Burlingham, Do.	—	140
John Harrifon, Panxworth, Do.	—	130
Thomas Saul, Blofield, Do.	—	19
George Baker, Acle, Do.	—	140

The last gentleman (Mr. Baker) has also set, by hand, a large quantity of barley, which is found to answer the purpose as well as wheat; so would oats and rye, as they are grain that multiply, if they have room given to spread.

If this method was become general, it would save an immense quantity of feed, and keep the poor employed from February to May; and, as experience has proved, past contradiction, the great utility of setting wheat in so extensive a manner, might not the scale be extended—even through the three kingdoms?

CHAP. XXXII.

A Preface to Indian Corn.

THE present scarcity of corn stirs up the inventive ideas of those in power to remedy the evil, and a temporary relief may perhaps be hit upon by giving a bounty on corn imported, and also opening our ports for foreign bottoms, &c. but we apprehend it will drain our country of ready cash, and we shall still be subject to the frowns of our enemies, and danger of the seas. Whereas, it is humbly conceived that plenty might be acquired in our own kingdom, and with much more certainty,

tainty, were the following schemes pursued with energy, as there is no doubt but they would be crowned with success, viz.

1st. By inclosing and improving waste lands, by which the kingdom would perhaps produce one-fourth more grain.

2d. By a general practice of Dibbling Corn, which would save to the kingdom one million of quarters in feed-corn, and which, by the present method, is thrown away to gain a worse crop.

3d. By encouraging the general growth of Indian corn, its increase being amazingly great, and its management so easy, that it would produce abundance for every sort of consumption, whether for the human, or brute creation.



CHAP. XXXIII.

*On Indian Corn, its Perfection, and
how to raise it.*

MUCH may be said in favour of this grain, to prove its utility. In fact, it is the staff of life to the common people of America, and all other countries where the climate suits; it is easily managed, done with little labour and dung; if dilatory people neglect to harvest it in due time, it will take no damage by frost, snow, or rain; as sometimes it is let stand on the ground all winter; it does not require much barn room to thrash it in; as women or children can do a great

great quantity in a little time, when sitting at the fire side, by rubbing one ear against another, being the chief method of dividing the corn from the straw; no time is lost in winnowing, as it has no chaff; it is a strong hearty food, and may be converted into several sorts of dishes, both for rich and poor, and at different periods of time, as for instance: Early in the summer, it makes a good dish when eat young, as garden stuff, in place of green pease. It also makes a better hasty-pudding or stir-about, than oatmeal, and is as good a thickener for broth or gruel of any sort. It is likewise a good substitute for beans, being a strong feed for horses, on which they work well; in short, it is a quick fatterer, and a sweet feed for all sorts of cattle, hogs, or poultry. Its blades or leaves are also better fodder than any sort of straw, particularly that which is stripped off when

standing green in the field, and which is generally done in the middle of summer, while growing in its full vigour, and tied up in small sheaves to be preserved for winter use.

Adding to all these good qualities, the same quantity of ground will produce more refined matter than that of any other corn; it has often been known, that an acre has produced an hundred Winchester bushels, but fifty or sixty is a common crop. As all these are facts well known, the next question is, whether or not the climate or lands of England is proper for the crop? they certainly are, for it has been raised and brought to as great perfection in England, as in America, as gentlemen have been known to raise it in their gardens, therefore what can be done on a small scale, may be done on a large one, if managed in the same way. By persevering in
prac-

practice, things may be brought to perfection in England, which a few centuries ago was thought impossible.

In Queen Elizabeth's time, about 268 years ago, it was imagined garden stuff, such as cabbage, carrots, turnips, onions, potatoes, &c. would not come to perfection in England, most of these articles were imported from the Netherlands in their days; but we now find that not only these, but even peaches and nectarines, can be brought to perfection so far north as Scotland; then why not India corn succeed here as well as in North America, about Boston, Old York, Newbury-port, Portsmouth, and from thence to Maryland and Alexandria? The Climate does not differ so much as to make any material change in the growth, and the lands are made of the same sort of materials, the country being variegated with sand, gravel, clay, &c. as in England.

However, it is to be observed, that the same sort of India corn which grows in general to the south of Mary-land, will scarce ever come to perfection in the north of New England; neither is it of so good a quality. Five shillings per bushel has been given for Indian corn that was grown near Newbury-port, when that could have been bought which grew to the south of Alexandria for four shillings, therefore it is the North-country corn that we would advise to be introduced into England, because the South-country grain would not ripen, consequently would hurt the experiment, till people were acquainted with the difference of the growing quality, as both sorts go promiscuously by the same names of India-corn, India-wheat, or maize. However, a true judge will immediately see a material difference between the South and North-country corn; the former

former is a long white grain, not much unlike a hound's tooth in shape and colour, only thicker at the end; whereas the North-country corn, though in shape nearly like the other, is much shorter, and of a bright yellow cast; but of this there are also two sorts, viz. early and late; the early will come ripe three weeks or a month sooner than the other, consequently this is what is most proper to be introduced into England.

The difference of the grain cannot be distinguished by the eye, but must be recommended by report of it being the earlier growth.

This corn does not grow near so high as maize, or that from the South-country, its chief height is only about four feet, whereas, the maize will rise from seven to eight feet high, consequently this dwarfy sort may be planted nearer together than the other.

The South-country corn must have six feet between hill and hill every way, and the North-country only four feet between hill and hill in the rows, and five feet between each row.

They are called hills, though in fact they are not so, till raised by drawing the mould up to the roots of the corn, at three different periods, viz. first, when the plant is about six or eight inches high, and again, about a month after; and the last time when the topfairs or downy parts are shot out, which is about a month more.

The most proper ground for this crop is that of a warm, sandy, gravelly nature; it must be plowed and properly tilled for the purpose, after which sow the seed, four grains in a hill, at an equal distance from each other, in a circle of about nine or twelve inches diameter, and cover the seed with about two inches
of

of mould, provide rods with four and five feet marks on them, and as you go on setting the corn, lay the hills out four feet distance from each other in the rows, and five feet between the rows, measuring from center to center, the five feet space will give room to plow between them to kill the weeds. Till the ground and make it fit for a crop of turnips, which may be sown after the last earthing up the hills.

The space between the hills in the rows where the plough cannot come, must be hand-hoed.

As the hills are at such a great distance from each other, it is a good method to mix a shovel-full of rotten dung or ashes in every hill, in such a case a little manure will go far, and it immediately takes place to feed the crop.

The best time to set the corn, is from the latter end of February to the middle of March, earlier the bet-

ter, when the weather is mild. The crop is fit to reap when the corn is hard in the ear, or the leaves or blades turn yellowish; it is reaped with sickles, like wheat.

Those who have barn-room sufficient may thrash it on hurdles, but the most common method in America is, to take an ear in each hand, and rub the corn out one against the other; this is common, and may be done by women or children, as above observed.

Birds of all sorts are fond of this corn, therefore great care must be taken that they do not destroy the crop as it comes up; this we were not aware of at first sowing, in consequence of which it was not guarded against.



CHAP. XXXIV.

A Pickle to prevent Birds from destroying Corn.

TAKE of old urine, three quarts,
one quart of bullocks galls,
one quart of train oil, one ounce of
copperas finely bruised, mix all to-
gether, let it stand till the copperas
is melted, stirring it often, steep the
seed therein one hour, after which
drain the liquor from it, and then
take an equal quantity of foot and
lime, and mix this with the grain,
till it is candied over in the nature
of a comfit, with as thick a coat as
you can possibly get to stick. Pro-
portion your liquor to the quantity
of seed you have to sow, and what
spares

spares reserve for future use, as it improves by age.

This is also a good pickle for English wheat, to prevent the vermin from destroying it. We have known mice scratch to the grain, and leave it there without eating.

CHAP. XXXV.

Illustrations on Indian Corn or Wheat.

WE are to observe, that as English wheat is the king of all grains, for the finer palate of human species, so is this corn or wheat the king of all grains for the brute creation, as well as the staff of life for the lower class of people, who are not blessed with means to procure the finer and most expensive sort;

fort; and indeed it seems as if nature purposely intended it should, by its being so very prolific in its produce, which is so amazingly great, as almost to surpass belief.

It likewise seems as if nature designed it for the poor man's crop, by its being more easily managed than any other grain, and less liable to disasters of taking damage by bad harvest when reaping.

Its stalks are so strong, as not to lodge by overmuch wet, neither is the grain liable to smut or mildew.

It requires less labour in sowing or tilling the ground than any other grain, for in point of sowing, as there are only four grains set in the middle of every four feet, one person may set an acre in a day; and as only one foot square in the middle of every four feet (in which the corn is set) need be manured, a load will be sufficient for an acre; supposing only a shovel-full at four feet distance

distance from each other, as it is not the great space of four or five feet that are wanted for the roots to feed in, (for they do not spread so wide,) but it is to give circulation of air for the plants, which nature throws up in a tall bushy top, and also to give liberty for the plough to go to till the ground and kill the weeds, which would stagnate the air; and likewise to prepare the soil for a crop of turnips, carrots, &c. which may be sown even while the corn is growing, at Midsummer, as before observed, in fact, taking it in all its perfections, it is the most valuable grain extant. English wheat only exceeds it in its whiteness of flour and bread.

Indian wheat has every other advantage; it is a substitute for all other grain, in which it has been tried, except malt; and there is little doubt but it would make as good malt as barley, as it produces more flour, having no bran.

It

It is a beautiful ornament in a garden, at the same time it is bringing forth the seed; it supplies the place of green peas, and is much cheaper in feeding the ground; neither does it require flicks to rod it like them, and in every case the same ground will produce much more refined matter than any other grain, owing to its being all flour, having no bran or husk.

Indeed it is amazing that a grain of so great utility should escape the notice of England so long; but the general fear was, that it being the native of a hot climate, it would not ripen here; however, it is now proved past a doubt, that there are two sorts very proper, and will come to great perfection in England, but one will ripen three weeks or a month sooner than the other, though sown at the same time; there are other sorts that will grow, but not come to perfection here.

The

The Author supposes he has taken an effectual method to establish the proper sort, it being raised from seed he himself brought from America, and as his subscribers has both seed and directions how to raise it, he flatters himself it will soon become general for the good of community. He also has no doubt but good malt might be made from it; if so, the drink would doubtless have a better body than from barley, as it is all meal, and no bran or husk; however, this is only supposition, but it certainly is worth a trial.

The produce is very great, sometimes more than 3000 fold.

Perhaps, when it has good rich ground and tillage, it may produce three or four ears from one grain, and each ear will contain from 500 to a 1000 grains, therefore, suppose only one ear on a stalk, it cannot bring less than 500 fold.

Much less than one quart will sow

an acre; however, this depends chiefly on the size of the grain; the dwarf or early sort is the smallest, consequently will take the greatest number of grains to fill the measure.

A Copy of a Letter addressed to Sir John Sinclair, Bart. President of the Royal Board of Agriculture, which was laid before them, and for which the Author had the Honour to receive the Thanks of the honourable Board.

SIR,

Having perused some of your remarks on one of the most valuable of all sciences, (Agriculture) I cannot but admire your praise-worthy talents for improvement in a science so interesting to human nature, it being from the earth that living matter is supplied with nourishment; from hence, also, the philosopher's
ideas

ideas are more refined, by contemplating the works of Nature, it being a field that never can be exhausted of subjects for fertile brains to try their talents in. In short, the most refined ideas are the properest to make an improving farmer on. It is true, repeated experience, proved by length of time, finishes the work; but we must think before we act. Therefore, the strong thinking philosopher is the first mover of every scheme for improvement. If he be lucky enough, by depth of thought, to see with the eye of reason what will be the end of his new scheme, he will the quicker succeed in the enterprize; but if not, he may long row in troubled waters, twist and turn many ways to prove by dint of experience, before he arrives at the haven of success.

These ideas remind me of a paragraph I lately saw in a newspaper of a scheme that was in contemplation

tion by the Agriculture Society; which was, to give a large premium for the best method of raising potatoes on any sort of land; which, from my long experience in that branch, makes me doubt that the improvement will not be adequate to the expence, as this crop is well known already, easily managed, and I believe brought nearly to the height of perfection. I myself have been trying experiments thereon in England and Ireland 50 years, and have treated largely on the subject in all my books of husbandry. I was the first that raised potatoes from the seed of the apple, which is now commonly done in Lancashire and other parts; and as growing them on land that never had them on before, has been long practised in Ireland; it is common there to give five or six guineas per acre for old grass land that perhaps never had been broke up in the memory of man.

Potatoes

Potatoes will also come to great perfection in thin gravelly mountains, covered with ling, or a deep bog, if they have plenty of stable dung; in short, they are not nice in the choice of the ground, provided they be suited with manure proper for the soil they are set in.

Were I capable of advising, it should be to give premiums for some new crops not commonly known in England, and none has fallen under my observation so likely for success as Indian corn; this I have repeatedly tried, and found to answer both in England and Ireland, but in the former rather the best; because the land and climate is nearest like to that in North America; about Old York, Newbury Port, Portsmouth, Boston, Rhode Island, &c. are the places where the best in America is grown.

I have treated on the growth of Indian corn in my former publica-

tions, and given my reasons why it is the most profitable poor man's crop extant.

The greatest difficulty lies in procuring the proper feed, there being several sorts which go under the denomination of Indian corn, but only two that would answer for this climate ; therefore, the risk that this experiment would split upon would be for want of the right sort of feed at first, as a wrong sort would throw a damp on the improvement.

I am, SIR,
Your most humble
And obedient servant,
C. VARLO.

Copy of a Letter from Sir John Sinclair, Bart., to Charles Varlo.

SIR,

Your letter concerning Indian corn was received and read to the Board; they are much obliged to you for this mark of your *attention*. When any thing similar occurs to you, they will be received with pleasure.

I have the satisfaction to inform you, that the Board requested me to convey you their thanks.

I am, SIR,

Your Obedient,

Humble servant,

JOHN SINCLAIR.

Board of Agriculture,
Whitehall,

Feb. 24, 1795.

To Mr. Varlo,
No. 2, Southampton Row,
New Road, Paddington.



CHAP. XXXV.

A new invented Threshing Floor.

THOUGH this is a simple contrivance, yet it answers the purpose well, and any farmer may make it himself, viz.

Take deal boards two or three inches thick, and as long as will reach from one mow to the other, and as many as will cover the floor from door to door; then bore the boards full of holes with a taper tap-bit, such as coopers make use of, and make them as wide as you think the corn will pass freely through, but observe, that the holes be all tapered one way, and at about

two inches diameter from each other. The bords being thus prepared, the next thing is, to provide three rows of trussels, that will reach from door to door, and each trussel must only have three feet in it, on which they will stand steadier than with four.

One row must go along the middle of the floor, and a row at each side; on these lay your boards close to each other. Most floors are about 12 feet wide, consequently the boards must be 12 feet long, therefore, one row of trussels, as above observed, will be under the middle of the boards, and a row under each end. Lay the narrow part of the holes uppermost, by which the corn will never stop or clog up the holes, as it would do if the wide part of the holes were upwards; the upper part of the boards would be better to be planed; but if they be deal, and straight cut, they need not be planed at the edge, as they will be

I

close

close enough without, and should any corn drop through, it matters not.

The height or length of the feet of the trussel depends on the farmer's choice; the higher the stage, the more corn the floor will contain under it, till the time of winnowing. When it is laid of an even thickness all over the floor, it will hold a great quantity.

The boards must not be nailed, but laid loose, that they may be easy moved to one side, while the corn is winnowing on the bottom floor. If it be winnowed with the machine invented by this author 50 years ago, which may be known by going with a multiplying wheel, making a wind in a box, which winnows, riddles, and screens at the same time; the said machine may be worked in little room, and with great satisfaction.

The said moveable floor may be quickly taken away to admit carriages coming in with corn, &c. as usual.

CHAP. XXXVI.

*The Perfections of the new-invented
Threshing Floor.*

THE utility of this floor perhaps is greater than may appear on a cursory view, until its perfections hereafter are explained, viz.

The boards being loose and hollow, rebounds with the stroke of the flail, and makes it rise much easier than when it falls on a dead body, insomuch, that a man may use a flail heavier, and by which he may thresh more corn, and with much more ease; and as the holes let the corn through, as soon as it parts the straw, it, as it were, riddles

dles the corn at the same time, and which saves much time and labour in making up the floor.

It likewise saves both loss of corn and labour in shaking off the straw, for by the present method, much loose corn is thrown out with the straw, for want of well shaking; but such cannot happen with this floor, for it keeps itself clear from corn by the perpetual motion or shaking of the boards; and by being kept clear of corn, it threshes cleaner and quicker than by the present method.

And to add to these advantages, the floor standing perhaps three feet high, cattle, pigs, &c. cannot so easily run upon it, when the doors by chance are left open.

Another advantage is, that no barn room is lost by corn holes being made as usual under the mow, as the under floor answers for this purpose, and much better, as the

corn lies thinner, therefore will not grow musty, should it lay longer than common without winnowing, which is sometimes the case when it is new and soft, occasioned by a wet harvest, &c.



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